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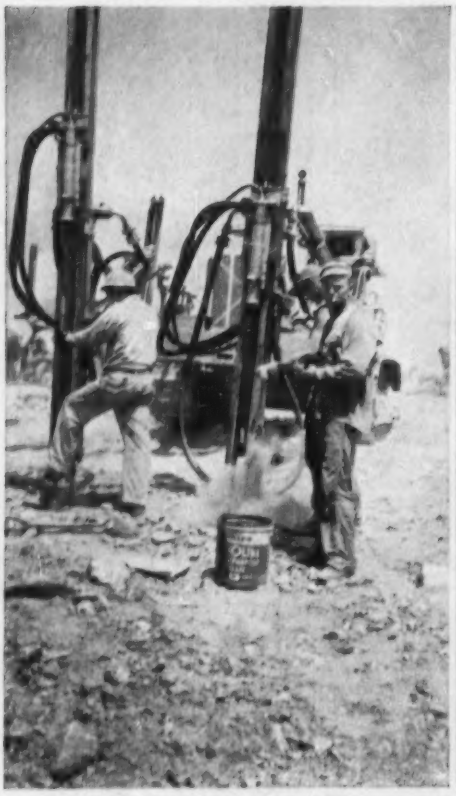
CONSTRUCTION METHODS AND EQUIPMENT

September 1955

A McGRAW-HILL PUBLICATION



Making Time on the N.Y. Thruway!

Le Roi 600 cfm compressor and Cleveland T-286 drill rig speed drilling operation

Motorists aren't the only ones who travel fast on the N. Y. Thruway. Contractors had to make plenty of time, too.

That's why this contractor made a mobile drilling unit out of his D-8 Cat. He used as components a Le Roi 600 CTM compressor and the Cleveland T-286 drill rig.

The compressor is designed especially for use with D-8 or TD-24 tractors. It is the only unit that attaches directly to the PTO and has a clutch as well. Capacity of the unit is 600 cfm.

The T-286 drill rig consists of two Cleveland patented air feeds, and Cleveland 4" drifters with air-motor booms. Here, it is mounted on the front of the tractor and has a spread of 220 degrees suitable for any variable drill pattern. Ten-foot steel changes, faster set-ups, better hole spacing, greater footage, better fragmentation—mean faster drilling and lower costs.

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B.F.Goodrich

All-Nylon All-Purpose tires roll 55,000 miles for building materials company

HIGHWAY, shopping center, housing development, industrial plant — all types of construction use concrete and a host of other materials from Hilltop Building Materials, Inc., of Cincinnati. 100 ready-mix trucks, 20 dump trucks and 6 flat bed trucks range over southwest Ohio highways, on rock and rut-choked roads, as often on no roads at all.

"ALL-PURPOSE TIRES give excellent traction and clean very well," says Hilltop Fleet Superintendent Edgar Pitzer.

That's why Hilltop uses B. F. Goodrich *all-nylon* All-Purpose tires. The report: *all-nylon* All-Purpose tires can be recapped, give up to 55,000 miles of service.

All-Nylon body

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A 20-TON LOAD of concrete at a construction site. Hilltop gets a longer run-per-dollar from all-nylon tires.

Put an end to unnecessary tire failures and costly maintenance. See your B. F. Goodrich retailer now and find out how *all-nylon* All-Purpose and other off-the-road tires can save you money. (Also available in lower-cost rayon construction.) Look under Tires in the Yellow Pages of your phone book or write *The B. F. Goodrich Co., Tire & Equipment Div., Akron 18, Ohio.*

Specify B. F. Goodrich tires when ordering new equipment.

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

9,000 square feet of Symons Forms were re-used 12 times on this job. William Baumeister Construction Co., St. Paul, general contractor.

Spandrel Beam Forming Costs Cut ⅓ with Symons Forms

Because of the efficient combination of Symons forming, shoring and scaffolding methods, the contractor was able to cut his estimated cost by two-thirds on the $2,000,000 home office building of the Minnesota Mutual Life Insurance Company of St. Paul, Minnesota.

In addition to savings in labor cost, considerable time was saved in forming the Spandrel Beams of this 9-story building. The adaptability of Symons Shores with their safe "T" heads speeded the forming and scaffolding work. 2 x 8 ft. Symons Steel Rib Forms were used to frame 56,000 square feet of spandrel beams. Symons Shores were used throughout in beam construction. All foundation walls are 16 feet in height.

Symons Engineering Staff furnished complete form layouts and cost sheets for all the form work. This service was rendered at no charge to the contractor. In addition, Symons fieldmen gave regular on-the-job service.

Symons Forms, Shore and Column Clamps can be rented with purchase option. Paid rentals apply on purchase price.

View of a spandrel beam after Symons Forms have been removed.

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Volume 37 Number 9

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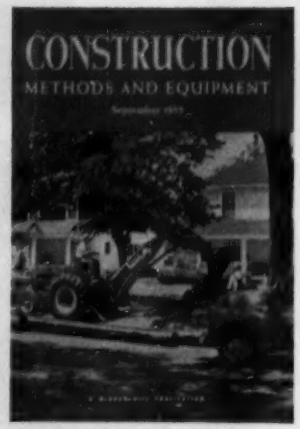

On the Cover ...

An Ottawa backhoe works across a residential section of its home town, Ottawa, Kan., digging a 3-mi water-main trench for the city's Water and Light Department. The pipe being installed is a bolted-flange lock-type 12-in. water main manufactured by American Cast Iron Pipe Co. It will be used as leads from water pressure towers at each end of the city to balance working pressures and augment existing water facilities. The hydraulically operated backhoe is capable of digging a 36-in. trench to a maximum depth of 11 ft. It is manufactured by Ottawa Steel, Inc., and is mounted on a 30-hp Minneapolis-Moline RTI wheeled tractor.

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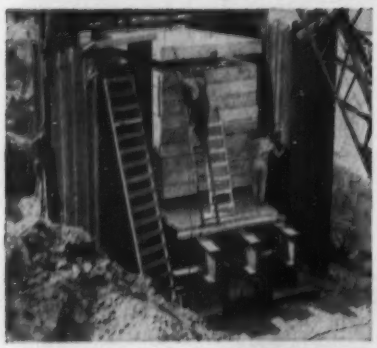

Checking Foundations with 120-Ton Load on H-Bearing Frames Anchored to Foster Piling
Hotel - Department Store - Parking Facility
THE DENVER COLORADO PROJECT

Contractors Webb & Knapp got a *Head Start* on this gigantic project by calling Foster for rental steel-sheet Piling, to complete four sumps (that were holding up the major excavation of this 400-foot square foundation). Foster delivered *on time*, the exact sections and exact lengths of steel-sheet Piling needed to get a head start on work schedules.

Foster 12"x 53 lb. H-Bearing Piles driven an average depth of 50 feet, around perimeter of the gigantic 400 foot excavation.

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Pay Dirt in This Issue

September, 1955

Controlling Caisson Buoyancy Is Tricky Job 50
Capping dredge-well bottoms proves a safe, simple and economical way to control sinking of bridge caissons

Drill Climbs Slopes Easily on Rails 55
Army Engineers mount a rotary drill on rails to move up and down 2:1 slopes at the abutments of Garrison Dam.

Self-Propelled Shield Braces Deep Trench 56
California contractor develops self-propelled trench shield capable of supporting trench walls 15 ft deep.

New Tricks Simplify Slab Prestressing 58
Improved methods of unreeling wire, jacking and handling make pre-tensioning of precast deck slabs easier.

Linked Car-Floats Quickly Sink Tunnel Tubes .. 62
Two car floats joined 50 ft apart with steel girders eliminate fleet of floating rigs on tube-sinking.

Paving...How to Get the Best Results 82
The first of a new CM&E series of articles on paving techniques tells about bituminous surface treatments.

Top-to-Bottom Safety Program Gets Results 104
Careful planning and fixing responsibility at all levels reduces accidents toll on 45-story Manhattan skyscraper.

Take to the Airways to Speed Maintenance 115
CM&E survey shows contractors are finding two-way radio an invaluable tool to keep men and equipment working.

Jacks Raise 6,000-Ton Hull for Radar Unit 141
Triangular 200-ft hull 20 ft deep goes 155 mi to sea, climbs up 87 ft on 12 caissons, sinks 3 permanent legs.

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NEXT MONTH

Contractor building 58 piers for an approach to the new Delaware River Bridge is saving better than 50% in time and labor of placing reinforcing and forms. Next month CM&E will give you details of this money-saving method.

(Advertisement)

Gorman-Rupp Pump WINS PRAISE in Yuma Desert Project

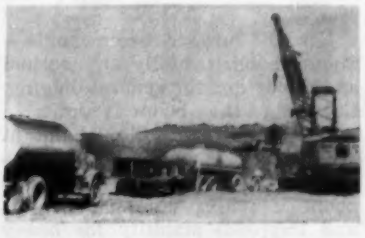
In the Yuma desert section of Arizona 65 miles of lateral canals are under construction for the United States Bureau of Reclamation. The Morrison Knudson Co., Inc. is the contractor for the project.

These interesting on-the-job photo shots give a graphic picture of the operation. The inset close-up shows a Gorman-Rupp two inch, high capacity, centrifugal pump mounted on an F.W.D. Truck. This pump was used to transfer mixing water from the 3000 gallon transport unit, shown in the lower picture, to the paver on lining operations.

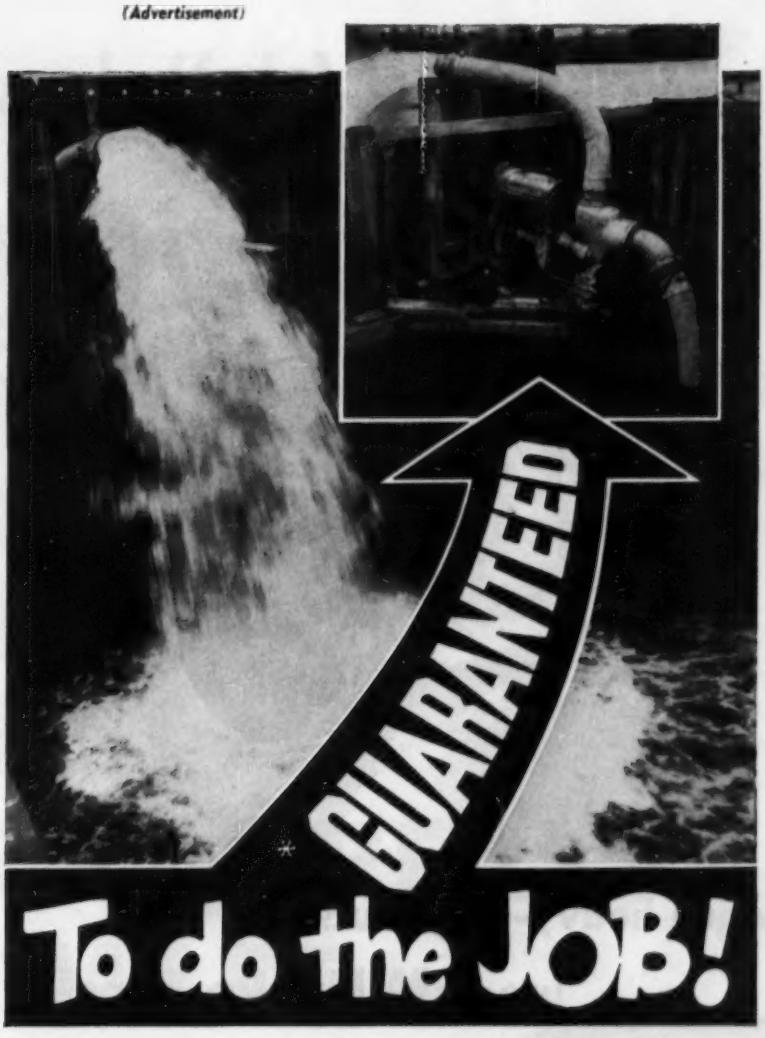
The fact that this pump had been in use for about a year and a half and during this entire period had given maintenance - free service demonstrates Gorman-Rupp dependability on the toughest jobs.

Gorman-Rupp Model 3209

Close-up of pump on truck



Typical view of Bureau of Reclamation Project in the Yuma Desert.



The river pours in — cofferdam piles spring leaks — men take risks or work is held up by flood water.

Dependable pumps are of vital importance, working side by side with the men, shift after shift, day in, day out.

To meet target dates, concrete pouring must be non-stop, trucks must move, the job must hum! Keep pumping and you do it.

Make sure — put Gorman-Rupps on the job *before* you have trouble. Our plain language guarantee is backed by a long record of proven performance *On-The-Job.*

**Ask for Bulletin and the Guarantee*

NOTES FROM THE FIELD

At the Sandusky River bridge on the Ohio Turnpike Gorman-Rupp pumps worked around the clock with men on 3 shifts. At times they pumped 3 weeks continuously, 24 hours a day and no trouble.

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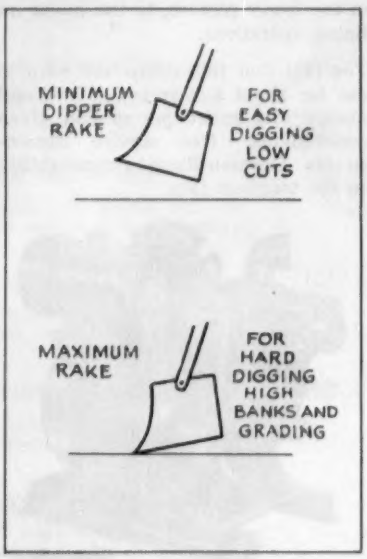
Job Talk...

...About Shovel Operation

A HANDY BOOKLET, "125 Ways to Better Power Shovel-Crane Operation," published by the Power Shovel & Crane Association, offers these suggestions on how to get more production from shovels:



• **Set dipper at proper angle**—Adjust dipper for proper "rake" or digging angle relative to the dipper stick for the type of material handled. Minimum rake is for easy digging and low cuts; maximum rake, for harder digging and for higher banks and grading. Don't try to lift a whole bank at one time. Slice it off instead. You should try to end up with a full dipper at the top of the cut. This permits the dipper to hoist through the bank more easily and quickly, with less wear and tear on the machine.

• **Use the proper boom angle**—Shovel booms usually are worked at 45 to 50 deg for general digging. Lowering the boom permits a longer cut in a shallow bank at better hoist rope angle; it also gives you extra reach. Raising the boom increases dumping heights and improves stability for heavy digging.

(Continued on page 8)

NEW... for rugged off-the-road operation

TOUGHEST CHASSIS GREASE EVER MADE...

New Purelube Heavy Duty Chassis Grease lasts 1⅔ to 2½ times longer than available chassis greases

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Sales offices located in more than 500 cities in PURE's marketing area.

New Purelube Heavy Duty Chassis Grease is tougher than chassis greases you've ever been able to buy.

It's the chassis grease tough enough to take the brutal impact of continuous off-the-road operation.

Rigorous proving ground tests showed that this new grease stays on the job 1⅔ to 2½ times longer than greases generally used for chassis lubrication. In extensive field tests, it continued to protect chassis parts when all other greases had failed.

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Pick out two similar pieces of your equipment operating side by side. Lubricate one of them with New Purelube H.D. Chassis Grease. Use any competitive grease you choose on the other. Then compare the results and see the difference for yourself, right on the job!

Try it. Mail the coupon, or call your nearest Pure Oil office now. (Offer limited to fleets operating in PURE's marketing area.)

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☐ Please send free folder giving complete information on New Purelube H.D. Chassis Grease.

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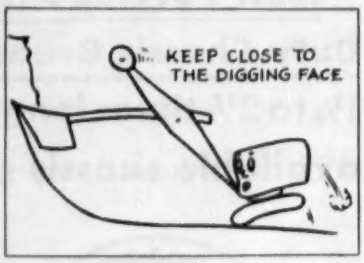
JOB TALK . . . Continued from page 6

• **Get heaping loads every pass**—A full load every pass produces more pay dirt than a faster cycle with a partly filled dipper. Make full loads the first objective; then, increase speed for faster cycles. Length and depth of cut should be judged to produce a full dipper. If blasting is necessary, banks should be well blasted. Blast holes should be deep to break out well under grade. Scratching out half-filled buckets cuts production, boosts maintenance.

• **Don't use the shovel to sweep**—Avoid sweeping the dipper back and forth like a broom in order to level off ahead of the machine. This causes side strains and wear on the shovel boom, dipper stick and dipper. Use the normal digging cycle for this kind of work.



• **Don't reach too far**—Many short moves will permit you to keep close enough to the bank to maintain the most efficient position by digging as nearly under the boom point as possible. Move up while you still have several feet of dipper stick left. Do not work out beyond the boom point more than necessary. This will save time and increase digging efficiency because when working with too much reach, you lose time crowding and retracting.

(Continued on page 13)

IF IT'S A REAL ROCK Shovel-

Any digging is EASY!

● When you have the power for the tough digging you can be sure of greater output in the easy jobs. If it's a real Rock Shovel any digging is easy!

Maybe your immediate problem is loading sand. Maybe you think that's always going to be your problem—loading sand, and you think you can get by with a lighter, less rugged machine.

Remember this! Northwest utilizes force most other independent crowd shovels waste. Watch a Northwest at work. With the Northwest Dual Independent Crowd the Northwest cuts through the bank smoothly without stuttering, without the restarts that delay other rigs. Uniform Pressure Swing Clutches are smooth in action and eliminate the jerks and grabs of ordinary clutch designs, assuring accurate spotting without waste of time or excess spillage. The "Feather-Touch" Clutch Control gives the *feel of the load* and simple mechanical design eliminates the complications of pumps, compressors, valves and tubing. Simplicity of design results in ease of upkeep and reduced down time and combines with other Northwest advantages to give high output that pays out profitably whether your digging is tough or easy.

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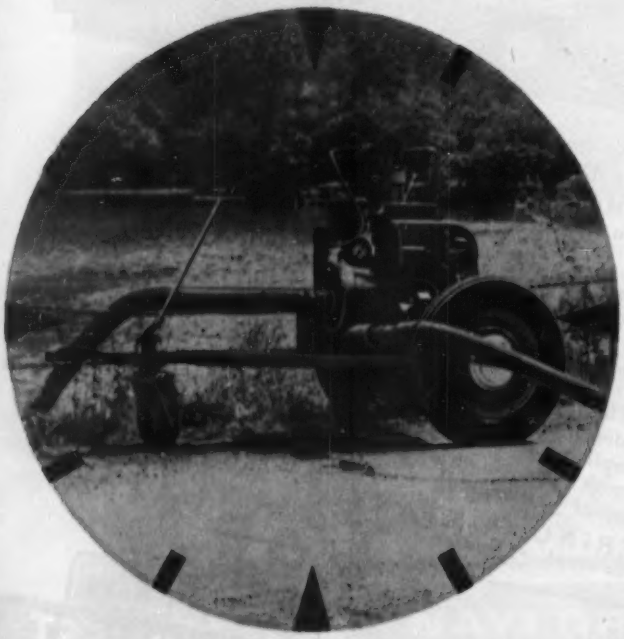

RUN FOR MORE THAN 1,600 CONTINUOUS HOURS! In Williamsport, Pa., this C2-90 was test-run in an actual pumping application for more than 1,600 hours continuously, without overhaul or any service except gas and oil. The engine is still in active service as a demonstrator.

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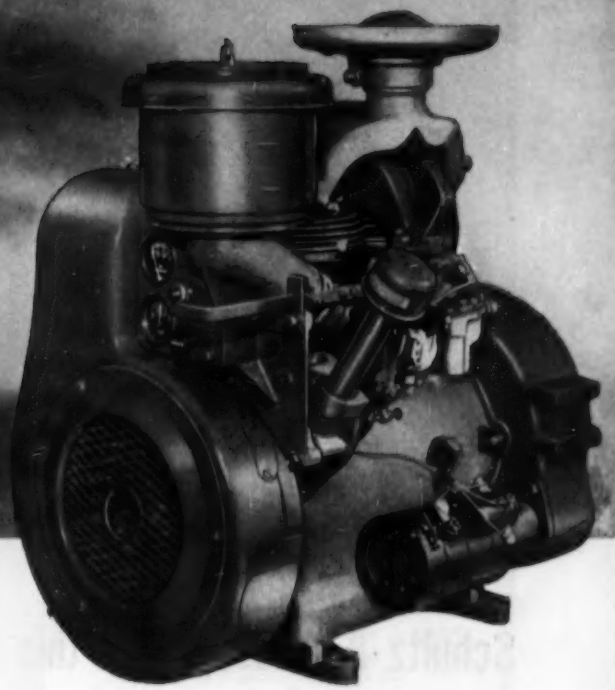

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The Blaw-Knox "Complete Paving Package" used by Schultz & Lindsay

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● Clamshell Buckets ● Concrete Buckets ● Base Course Pavers ● Road Wideners and Trench Rollers ● A "Complete Package" of ready-mix equipment, including Hi-Boy Trukmixers and one-stop Truck Mixer Loading Plants

See your BLAW-KNOX distributor about "Complete Package" advantages

North Dakota started the ball rolling toward faster travel between Grand Forks and Winnipeg by awarding Schultz & Lindsay Construction Company the contract to pave 11.4 miles of State Highway 44. And the Fargo contractor kept the job rolling by using a Blaw-Knox "Complete Package" of paving equipment to step up the paving operation to a profitable, schedule trimming pace.

Wherever there's a big paving project . . . super-highway, toll road, expressway . . . or airport runway . . . you'll probably find a balanced team of Blaw-Knox units speeding the job. More and more contractors all over the country are taking advantage of the one-source, one-responsibility economies of Blaw-Knox "Complete Package" paving methods.

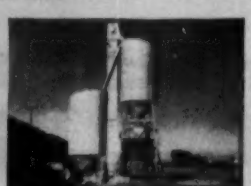
BLAW-KNOX

BLAW-KNOX COMPANY
CONSTRUCTION EQUIPMENT DIVISION, Pittsburgh 38, Pa.
Offices in Principal Cities

Blaw-Knox Aggregate Batching Plant used on "short-cut to Winnipeg".

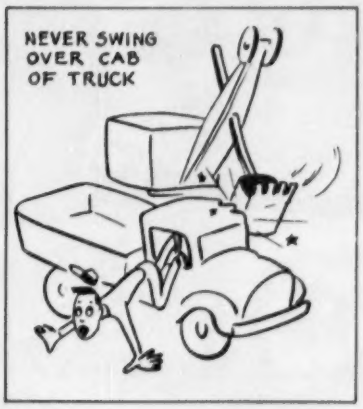
Schultz & Lindsay's Multi-Paver 360 DuoMix Paver.

A loaded batch truck on the ramp over Schultz & Lindsay's Blaw-Knox Precision Subgrader, on the way to the paver.


Blaw-Knox Cement Batching Plant on the North Dakota State Highway job.

JOB TALK . . . Continued from page 8

• **Dig the top half of bank first**—This will avoid lowering the dipper to the bottom each cycle. It also will prevent overburden from rolling into the pit. Then, follow by digging the bottom half. This method gives the shortest cycle time, hence the best production. Take the cut out in a series of layers across the entire face. Start digging next to spotted truck and work in toward the center of the cut.



• **Locate trucks properly**—Spot trucks so that they can be loaded from the rear. Never swing a load over the cab of the truck. In loading dangerous materials, have the truck driver get out of the truck and stay on the safe side. And when returning to digging position, don't let the dipper strike the lower side of the boom or the crawler tread belt—unless you want to see maintenance costs go up rapidly. A little care will save a lot of cost.

UNITED COMMUNITY CAMPAIGNS
Give...the United way

All Madesco Blocks Are Engineered to Serve Your Special Service Needs

MADESCO
EASTON PA

FOR SAFE AND SPEEDY HOISTING

Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Hooks equipped with bronze or anti-friction bearings for easy operation and long service.

MADESCO BLOCKS

Our special service departments will help you with their recommendations. Write for catalog or consult your equipment dealer who can supply you with MADESCO products.

MADESCO TACKLE BLOCK CO., EASTON, PA.
A Subsidiary of Nazareth Cement Company

HAE-MB-107,55

POWER when you need it

You'll keep your engines in shape for full-power performance by lubricating with one of the famous *Texaco Ursa Oils*. These great oils keep engines clean and free from harmful deposits, keep rings free and ports clear. Thus, you enjoy consistently dependable performance and low maintenance costs.

Texaco Ursa Oils are a complete line of lubricating oils especially refined and processed to make diesel and heavy duty gasoline engines deliver *more power* with *less fuel* over *longer periods* between overhauls.

For air compressors and hydraulic mechanisms, use *Texaco Regal Oil R&O* — it keeps compressor systems clean; prevents rust, sludge and foam in hydraulic systems. And to assure longer drill life, use *Texaco Rock Drill Lubricant EP*.

With effective Texaco lubrication, all your machinery and equipment will stay in service longer, operate at top efficiency. For expert advice in selecting the proper lubricants, consult a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . .
TEXACO STAR THEATER
starring
JIMMY DURANTE
on television . . .
Saturday nights, NBC.

TEXACO

TEXACO SIMPLIFIED LUBRICATION PLAN —
saves time and money, eliminates errors because you need *no more than six* Texaco lubricants for *all* major lubrication. Your Texaco Lubrication Engineer has all the details.
Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

It's Your Business . . .

Why Contractors Fail

Source: Dun & Bradstreet

% of Total Contractor Failures		UNDERLYING CAUSES	APPARENT CAUSES	% of Total Contractor Failures	
1953	1954			1953	1954
49.3	49.8	Incompetence	Inadequate sales	29.7	31.6
			Heavy operating expenses	22.8	23.1
17.4	21.9	Unbalanced experience*	Competitive weakness	19.8	22.1
			Receivables difficulties	13.7	14.9
14.8	15.4	Lack of managerial experience	Excessive fixed assets	4.9	5.1
			Inventory difficulties	2.1	1.4
			Poor location	0.6	0.5
8.1	4.9	Lack of experience in the line of work	Other	7.3	6.3
			Poor health	2.0	2.7
4.7	4.4	Neglect	Bad habits	2.2	1.1
			Other	0.5	0.6
			Irregular disposal of assets	2.0	0.9
			False financial statement	0.2	0.4
2.5	1.8	Fraud	Premeditated overbuy	0.0	0.2
			Misleading name	0.1	0.1
			Other	0.2	0.2
			Strike	0.5	0.3
1.0	1.1	Disaster	Fire	0.0	0.2
			Employees' fund	0.2	0.2
			Flood	0.0	0.1
			Other	0.3	0.3
2.2	0.7	Reason unknown			

*Management's experience not well rounded in sales, finance, purchasing and production.

Contractor Failures . . . Record for July

FAILURES AMONG construction contractors are running close to last year's record high. During July 102 contractors were failing, the worst record for this month since Dun & Bradstreet started to compile figures back in 1934. July was the fourth month out of the first seven in '55 when contractor failures hit a new high for the month.

So far this year, 751 contractors have gone bankrupt. While this is 2.2% fewer than the record number a year ago, failures among general contractors doing other than building and among building subcontractors are setting new highs. Failing subs number 465 this year, topping 1954's previous high by a narrow 0.9% margin. General contractors on other than building have a much smaller number of failures—42 so far this year—but this is 17% more than the old record in '54. By contrast, failures among general building contractors have dropped 10% below last year's high to 244.

A sharp increase in liabilities of failing contractors this year indicates that those who are going under are in deeper water than a year ago or there are more bigger firms folding. During the first seven months of '55, average liabilities per contractor failing were $58,000 compared with $41,000 average last year. In July, liabilities shot up to an average of $62,000.

Reasons for Failing

Chief reasons for contractors failures in 1953 and 1954 are inadequate sales, heavy operating expenses, competitive weakness or trouble collecting payments. They got into these situations because they lacked enough experience or their experience was not rounded in all phases of running the business or they were just incompetent.

The table above shows the reasons for contractor failures as analyzed by Dun & Bradstreet. Most significant in the table is that it shows how tight competition for new jobs contributed to the record

(Continued on page 18)

Down time is no joke. Say it happens when a clutch facing or a brake lining wears out.

If you replace with a Caterpillar-built part, here's what you're sure of: a friction part that's made of a material with high torque capacity but low friction loss, a long-wearing material that *really* resists glazing and chipping, a tough material that's been through rugged tests in the laboratory, on the proving ground, and out on actual jobs. In short, you're sure of *less* down time in the future.

If you replace with a substitute part—can you be sure of anything?

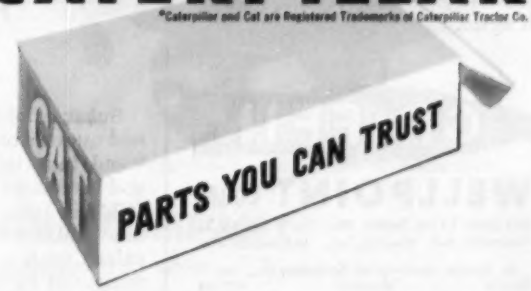
Better get genuine Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

These are genuine CAT® brake linings. They're made of a specially designed molded asbestos material. You can't buy better anywhere.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



HOW TO HANDLE
WET JOBS

LEHIGH PORTLAND
CEMENT PLANT

Bunnel, Florida

Contractors: Walsh Construction and Duval Engineering & Cont'g Co.

WELLPOINT METHOD SPEEDS
$11,000,000 PROJECT

SOIL ON THIS JOB was a coarse coquina shell—the very material to be manufactured into the cement. Thus, the site was a natural from the builder's angle. Not so from the pre-drainage angle.

• Water flows through coquina in virtual torrents, and old-timers will recall the days when such a problem—on a job this size—would have spelled headaches: possibly sheeting — certainly much added cost and delay.

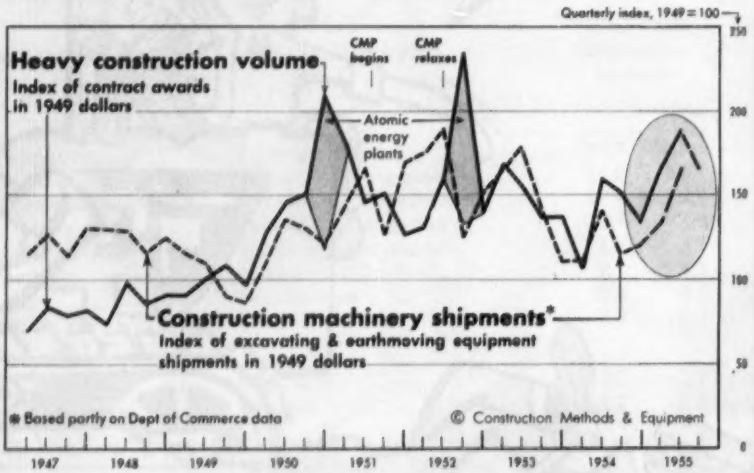
• Modern wellpoint methods — so many of them pioneered by Griffin —have changed all that. The system shown in photo dried the job quickly, perfectly and economically, pumping over 7,000,000 gals daily for more than a year. It was not by chance that the Griffin method was selected. Both contractors had used it before—and wanted it again.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

IT'S YOUR BUSINESS . . . Continued from page 16

rate of failures during '54 (last year failures climbed 27% to a record high of 1,305 contractors.) The percentage of contractor failures due to inadequate sales or competitive weakness increased more in '54 than any other reasons for failing.

Too much equipment and heavy operating expenses also accounted for a higher percentage of failures in '54 than in '53, although the increases were small. To some extent, this was because contractors had to spread their equipment charges and overhead over a thinner volume of work in '54 than in '53.



Equipment Shipments Near Peak Level

Construction equipment shipments increased sharply in the second quarter of 1955. The CM&E Index of Excavating and Earthmoving Equipment Shipments shot up 22% above the first quarter (see chart). The second quarter index at 164 is the highest since the second quarter of 1953 and 16% higher than a year ago.

Big increases across the board for all major types of machinery accounted for the rise. Tractors, including tracklaying and contractor's off-highway wheel-type, set a record dollar volume for units shipped in any quarter. They topped $111 million, 24% above the first quarter. Machinery for mounting on tractors also broke all records with a 20% increase in the second quarter to $24 million. Road construction and maintenance machinery was close to a quarterly record with $36 million.

While equipment shipments have climbed sharply, paralleling the construction contract trend, the contract curve is turning down seasonally in the third quarter (estimate on chart based on July-August rates). The third quarter is running below the booming second quarter, but it should be higher than any third quarter except 1952 when huge atomic energy plant awards added more than $2 billion to the total.

Highway Contractors Raise Prices In California and Colorado

Substantial increases in the second quarter broke the sharp downtrend in prices bid on California and Colorado state highway jobs (CM&E June '55, p 20.) California contractors blew the lid off prices with a 12.2% increase, as measured by the California Highway Division's Bid Price Index. Colorado prices moved slower with a 6.1% gain.

The California Highway Division expected a rise because it felt that bidders were reaching "the limits in devices for cutting prices

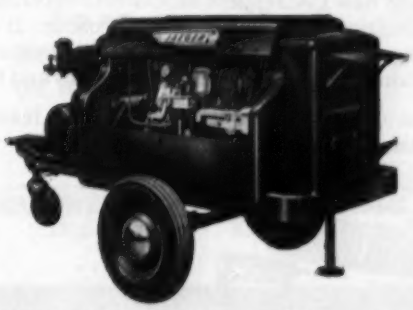
(Continued on page 28)

"WE HAD 100 LBS. CONSTANT AIR PRESSURE EVERY MINUTE OF THE 160 HOURS." On the new Ohio Bell Telephone building at Columbus, Ohio, Spencer, White & Prentis found that their Jaeger "600" Rotary maintained a constant pressure of 100 psi while operating a Vulcan No. 1 hammer, plus concrete breaker and clay spade work as needed. For 20 shifts (160 hours) it kept the hammer hitting 60 full blows a minute, driving 40-ft. H-Beam piles in a formation so hard that it sometimes took ¾ hour to drive a single pile.

It's "smooth as steam" with a Jaeger Rotary

As Spencer, White & Prentis noted on this foundation job, the Jaeger Roto Air-Plus holds steady pressure even under the extreme fluctuations of pile driving. This is because Jaeger engineers have developed fast-acting, close-regulating controls never before available on air compressors. Demands are answered instantly. All speed modulation is smooth and stepless and there is never any over-run to cause racing of the engine. Your Jaeger Roto will also operate at slower speed than any other rotary, using less fuel, causing less wear and tear.

Ask your Jaeger distributor to demonstrate — or send for Catalog JCR5, which gives full details.



This Model "125" Roto is also available for smaller work

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

PUMPS • LOADERS • MIXERS • TRUCK MIXERS • PAVING MACHINES

"Here's the plant that hits specifications easier and closer than any other plant we've ever operated . . ."

says **STREET BOYD**
of **STEINBERG-BOYD CONSTRUCTION CO.**
TULSA, OKLAHOMA

PAVING STONE

OKLAHOMA SPECIFICATIONS	CEDARAPIDS PRODUCTION % PASSING
100% passing 3"	100%
95-100% passing 2"	97.7%
70-95% passing 1½"	85.1%
50-85% passing 1"	61.7%
------passing ¾"	34.6%
15-40% passing ½"	19%
------passing ⅜"	10.6%
0-2% passing No. 4	1.9%

CLASS A

OKLAHOMA SPECIFICATIONS	CEDARAPIDS PRODUCTION % PASSING
100% passing 1½"	100%
90-100% passing 1"	95.9%
------passing ¾"	70.7%
25-60% passing ½"	29.7%
------passing ⅜"	12.4%
0-5% passing No. 4	1.4%

"... and we're getting 180 to 250 TPH in Paving Stone, 140 to 160 TPH in Class A from our new Cedarapids Portable Crushing Plant."

You can hit specs right on the nose, too . . . outproduce any comparable plant . . . and do it at the low production costs that step up your profit. That's some of the reasons Steinberg-Boyd is so well satisfied with their new Cedarapids Unitized Portable Crushing Plant. It consists of a 2540 Portable Primary, an 1836 Twin Jaw Scalping Unit and the brand new Cedarapids Model 30C Secondary Plant featuring the Symons Cone Crusher. It's a plant designed to meet the big output and exacting gradation demands of modern turnpikes and toll roads.

Best of all, this set-up has all the features that *make money for you* on every job.

THESE EXCLUSIVE CEDARAPIDS FEATURES ASSURE BETTER GRADATION BIGGER PRODUCTION LOWER OPERATING COSTS

1. VIBRATING GRIZZLY
. . . by-passes most of the undersized material and fines. Increases primary output up to 25%.

2. TWIN JAW CRUSHER
. . . increases primary crushing production up to 40% over single jaw units and is especially efficient in abrasive rock or gravel.

3. HORIZONTAL VIBRATING SCREEN
. . . steps up screening capacity because the horizontal position of the screen cloth gives 12½% more screening area than an inclined screen of the same length.

4. SYMONS® CONE CRUSHER
. . . produces high tonnages of uniform, fine-crushed aggregate, even in the hardest or most abrasive rock or gravel. The Symons Cone Crusher, built by Nordberg, and world famous for big-volume, low-cost operation, has been combined with Cedarapids mobility and quality construction to give you a portable plant with the high-profit features of a permanent installation.

Cedarapids Built by IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

NOW — See For Yourself
WHY You Cut More Concrete With

Clipper
CONCRETE SAWS

Look Inside — Behind the Engine for Famous Clipper Quality !

DEMAND THESE FEATURES for Lowest Cutting Costs

1. 4 Wheels with 3-Point No-Bind Blade Suspension
2. Self-Propelled with Abrasive-Coated Drive Wheels
3. Positive Screw Feed
4. Patented Water Application
5. Dashboard Controls

Model C-250
25 H. P. Optional Self-Propelled.
A Clipper Model to fit every Budget. Priced from **$395**

ONLY with Clipper do you get ALL these features in combination with Positive Screw Feed — an absolute MUST when cutting with "GreenCon" Abrasive Blades in green concrete.

Right from the dashboard, Clipper's Positive Screw Feed lets you compensate instantly and easily for the diminishing diameters of abrasive blades — the ONLY proven method of maintaining constant depth of cut. And Clipper's Self-Propelled pace never tires — cuts faster all day with less operator effort — cuts smoother for longer blade life.

OPTIONAL EQUIPMENT
includes:
Self-Propelling Unit;
Water Pump;
Self-Starter — with battery and generator

CLIPPER BLADES for Best Results

● **"GREENCON"** Save 80%—and more with new Reinforced Abrasive Blades that cut green concrete with widest possible range of Hard to Soft Limestone aggregates—Coral—Slag.

● **DIAMOND** A Blade for any job—any aggregate—every saw. Choose your Clipper Diamond Blades from a wide variety of specifications to cut green or old concrete with outstanding speed and economy.

By the Makers of Clipper Masonry Saws

ASK FOR FREE DEMONSTRATION ON YOUR JOB

Send Coupon for the Whole Story

Clipper
KANSAS CITY, MO.

Better Mail the Coupon NOW!

Genuine Clipper Products Are Sold Only Direct. Immediate Shipment from Factory Branches in Principal Cities, Coast to Coast. Mail Coupon for Same-Day Service.

CLIPPER MANUFACTURING CO.
2810 Warwick • Kansas City 8, Mo.

☐ I want a FREE DEMONSTRATION of a Clipper Concrete Saw.
☐ Send FREE Literature on Clipper Concrete Saws and Blades.
☐ Send FREE Literature on Clipper Masonry Saws and Blades.
☐ Have a Clipper representative call on me.

404X

Name_____
Address_____
City_____ State_____

"NYLON CORDS HAVE CUT OUR ROAD

says GEORGE ANDERSON, Jr.

Vice Pres., Anderson Trucking Corp., East Orange, N. J.

"Our 36 trailer trucks haul concrete pipe to construction sites ranging from Boston to Washington. Loads run up to 18 tons, and tires take a terrific pounding both on and off the highway. Often deliveries are made over rough, rocky ground at new construction sites. Tires have to be able to take it. We *used* to have a lot of trouble with our tires. We couldn't get a single recap, and road delays were a big problem.

"Four years ago we started using nylon cord tires to bring down costs per mile and reduce road delays. Since then, nylon cords have cut our tire costs per mile 36%. We're getting 1 to 2 recaps from our nylon cords and expect to get more. This gives us a minimum total mileage of 70,000 miles per tire—

YOU'LL FIND NYLON IN PASSENGER-CAR TIRES, TOO! Impact-absorbing nylon cords mean extra protection against blowouts . . . greater safety on any road.

DELAYS DUE TO TIRE TROUBLE 40%"

40,000 miles on original tread and at least 30,000 miles on recaps. That's more than *twice* the mileage we got from ordinary tires! Most important of all, nylon cord tires have brought down expensive road delays due to tire failure 40%."

For ten years Du Pont and leading tire manufacturers have been working together to perfect nylon cord truck tires. Now actual road experience proves nylon offers extra protection against tire failure. Truck users' reports show nylon cord tires mean fewer road delays, more mileage, more recaps—lower cost per mile.

Nylon has greater tensile strength, flex and abrasion resistance than any other cord used in tires. Nylon virtually ends cord ruptures caused by bruise breaks. Moisture seeping through cuts doesn't damage nylon. Nylon can take the hottest road temperatures you'll ever encounter in normal operations.

Prove to yourself that nylon cord truck tires give substantially lower cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON FOR TIRE CORD

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

FREE BOOKLET on nylon tires—write for your copy. Textile Fibers Dept., Room 11508, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

New H-5

1/2-Yd., 9-Ton Hydrocrane

★ ½-YD., 9-TON CAPACITY

★ 50-MPH TRAVEL SPEED

★ UP TO 240-FPM LINE SPEED

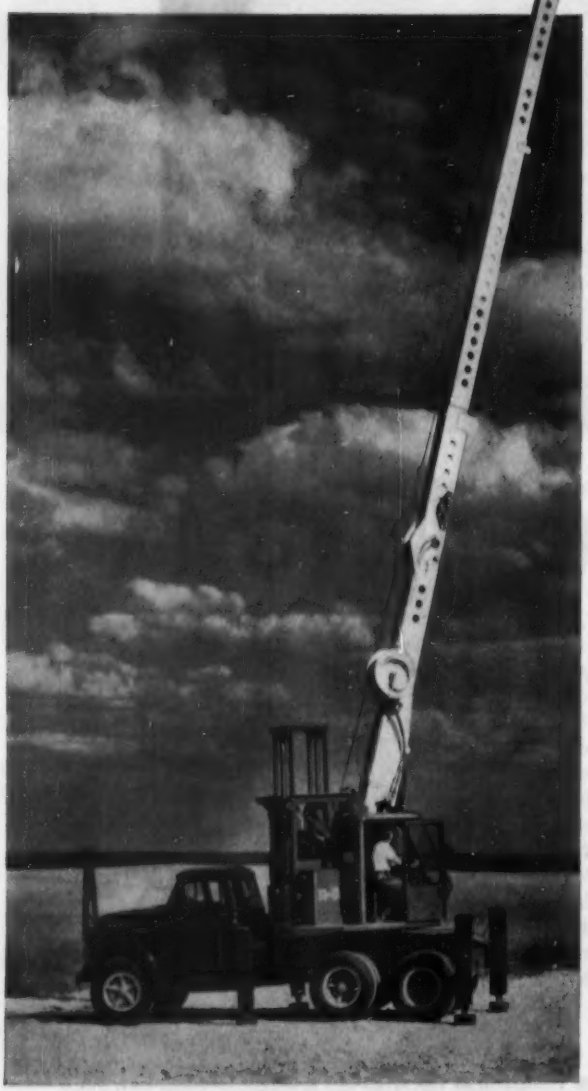
★ 24 TO 36-FT. STANDARD TELESCOPING BOOM

★ 38 TO 50-FT. HIGH-LIFT TELESCOPING BOOM

★ UNMATCHED PRECISION CONTROL OF LOADS

★ AVAILABLE WITH CLAMSHELL, CRANE HOOK, MAGNET, CAB

★ OPTIONAL REMOTE TRUCK CONTROL FROM CRANE CAB



The completely new, ½-yd., 9-ton H-5 Hydrocrane brings you the work ability of heavy, carrier-mounted cranes at small-crane cost. Because of its hydraulic outriggers this crane-excavator can be mounted on a commercial motor truck, new or used, without sacrificing any of its basic working ability. These outriggers give the Hydrocrane greater stability and lifting capacity than much heavier machines.

Bucyrus-Erie Company
South Milwaukee, Wisconsin

Gentlemen:
Send me your new H-5 Bulletin. This crane interests me for.....work.
(type of job)

★ *Name*.....
★ *Company*.....
★ *Title*.....
★ *Address*.....
★ *City*.....
★ *State*.....

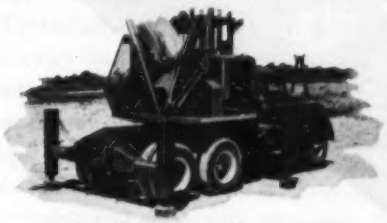
110H55C

BUCYRUS ERIE HYDROCRANE

Mounts on Conventional Truck

50-Ft. Boom Telescopes to Half Length For Travel . . . . .

All-Hydraulic Action Means Precision Control . . . .



1880-1955

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Years of Service
to Men Who Shape the Earth

High-lift, 3-piece boom (extra equipment at added cost) gives you 50 feet of reach, retracts to 25 feet for traveling. When machine arrives at job site, boom and hydraulic fittings can be connected and machine working in less than 10 minutes.

Both the 2-piece standard boom and 3-piece erector's boom extend and retract 12 feet — hydraulically. You can change boom length *while you're working* — move a load in and out of buildings or close quarters without moving crane an inch.

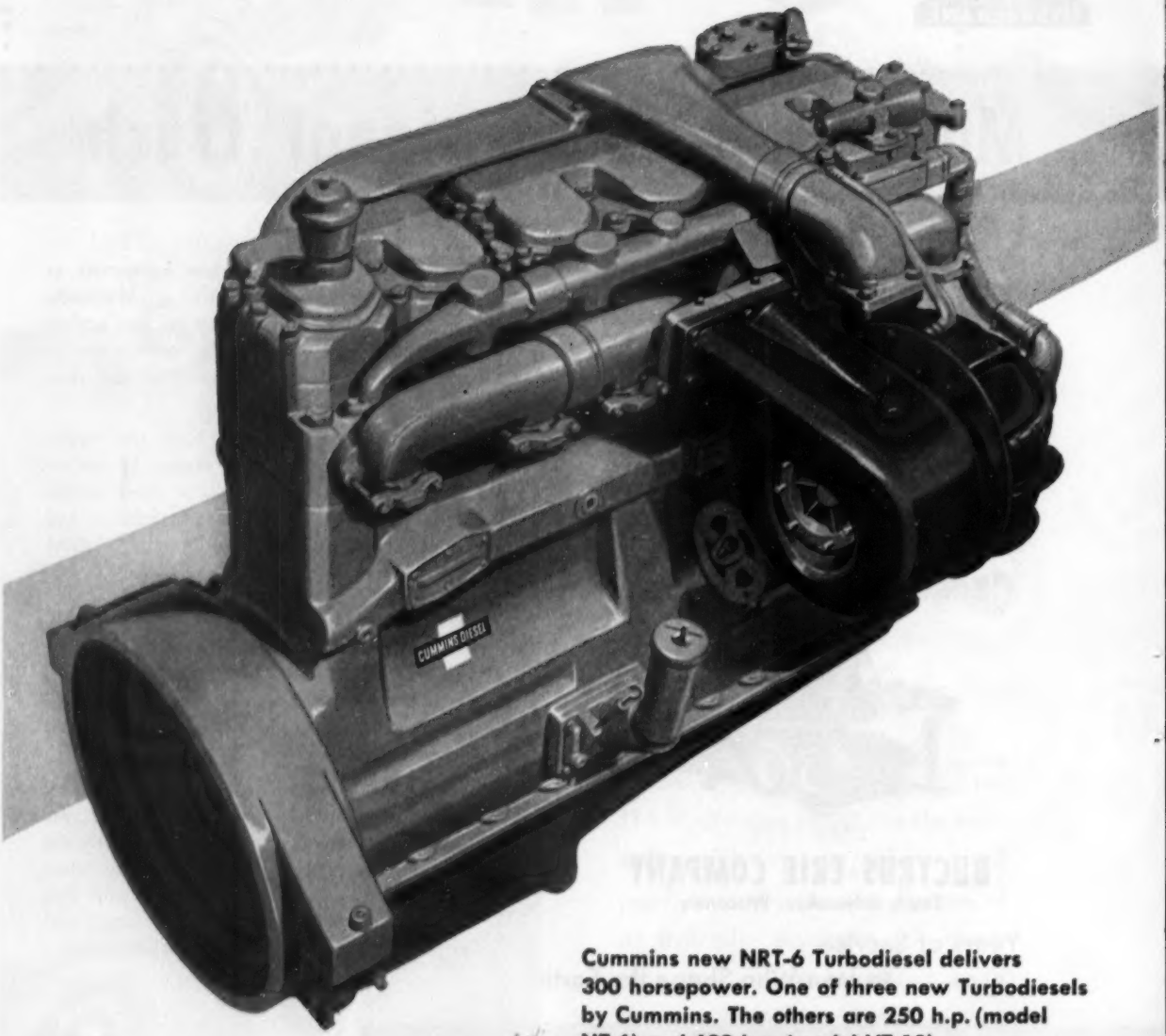
Every crane function is fully hydraulic — boom and line hoist, swing, outrigger set and retract, boom telescope, bucket open and close. Control is so precise loads can be inched into place when necessary, yet line speed is up to 240 fpm.

The H-5 Hydrocrane's combination of 18,000 lb. maximum lift, 50-ft. boom plus 20-ft. jib, and 50-mph top travel speed opens greatly expanded job opportunities — particularly when all these features are packed into a unit that can meet highway laws for over-all length and axle loads (depending upon truck selection.)

See It In Action

Find out what the new H-5 Hydrocrane can do for you. Ask your Bucyrus-Erie distributor about a demonstration.

NEW TURBODIESEL



Cummins new NRT-6 Turbodiesel delivers 300 horsepower. One of three new Turbodiesels by Cummins. The others are 250 h.p. (model NT-6) and 600 h.p. (model VT-12).

BY CUMMINS

ups your performance

and lowers your costs!

Cummins 300 h.p. turbocharged NRT-6 pulls full loads faster, permits higher speeds on grades, cuts cycle time, because it produces greater horsepower without increase in engine size or displacement.

Turbocharging—which harnesses exhaust gases normally wasted—produces this extra horsepower by achieving a more perfect air-fuel mixture in the combustion chamber. There is no parasitic load as in supercharged engines. This means drastically reduced fuel costs . . . fewer internal stresses . . . longer engine life.

In addition, Cummins exclusive PT fuel system is simple and trouble-free . . . makes fuel system maintenance costs negligible. It is so easy to understand and work with that no specialists are needed. And all Cummins Diesels run on inexpensive No. 2 diesel fuel or furnace oil.

For further information, see the Cummins distributor in your area, or send us this coupon today.

CUMMINS

Cummins Engine Company, Inc.
Columbus, Indiana

Leader in rugged, lightweight, high-speed diesels (60-600 h.p.)

Cummins Engine Company, Inc. Dept. CM-9
Columbus, Indiana

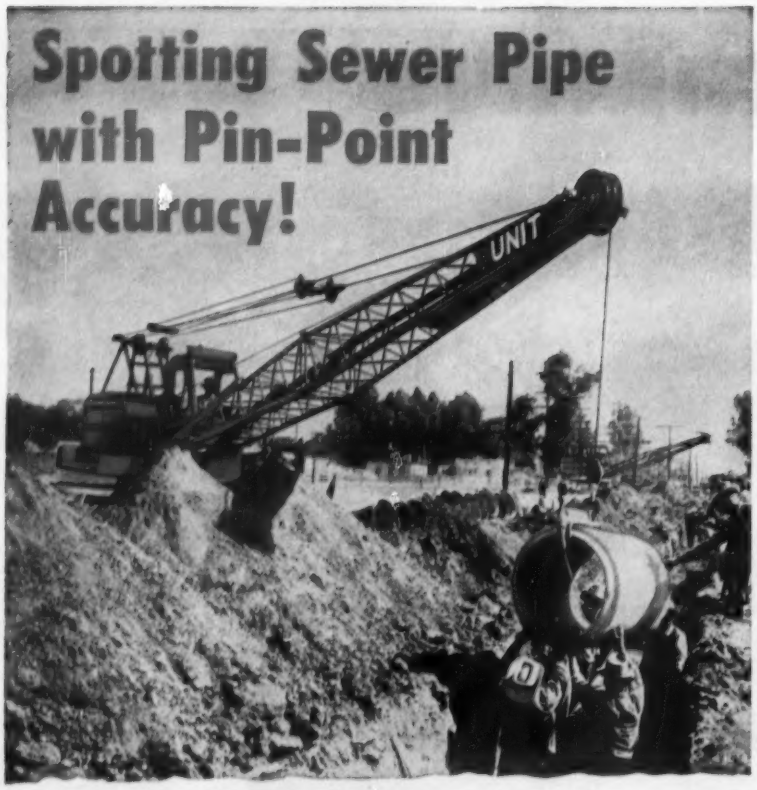
Please send me detailed information on Cummins new NRT Turbodiesel.

Name _____

Company _____

Address _____

City _____ Zone ____ State _____



UNIT provides ample power maneuvers easily

Here is the ideal crane for placing pipe exactly where you want it... and placing it FAST. This sturdy, dependable machine provides easy maneuverability, plus precision-steadiness. The safety-promoting FULL VISION CAB gives the operator an unobstructed view of the entire operation, at all times. Makes pipe-positioning more efficient, safer, more profitable to all concerned. On other jobs, too, UNIT is equally satisfactory. It will pay you to investigate.

UNIT Models are available in ½ or ¾ yard Excavators... Cranes up to 20 tons capacity... Crawler or Mobile type... Gasoline or Diesel. All models convertible to all attachments.

UNIT CRANE & SHOVEL CORP.
6305 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

Geared for Maximum Lifting Jobs

IT'S YOUR BUSINESS . . .

Continued from page 18

and trimming profits" and that bid prices would soon reflect rising labor and materials costs. The Division thinks "the rise in construction costs will continue for some quarters to come." For one thing, it expects steel bid prices to increase in the third quarter because of the mill price rise in the first week of July.

Sizable increases in all major bid items except structural steel pushed the California Index to the highest point since 1953—212.4, based on 1940-100. Biggest rise was a whopping 26% jump in concrete structures to $51.36 per cu yd. Big gains also came in plant-mix surfacing and crusher run base, both up 18%. Roadway excavation and concrete paving prices increased 8%, while reinforcing bars went up 3%. Structural steel prices dipped 3% in the second quarter, but this was before the more than 8% rise in mill prices which came in July.

The more moderate rise in Colorado's Highway Price Index put it at 83.1, based on 1949 as 100. While this was higher than the first quarter and 5.5% above the low second quarter of '54, it was a little below the fourth quarter of '54.

The highway price upturns in California and Colorado agreed in direction with the trend reported earlier by Texas. The Texas Highway Department Index moved up in April of this year to cancel out the first quarter drop (CM&E June '55, page 22.)

Federal Aid Highway Money

Still on the down side is the Bureau of Public Roads U. S. Composite Mile Index of federal-aid-highway bid prices. It dipped 1.6% during the second quarter. This is the second consecutive decline following a firming up in the last quarter of '54.

Actually, the BPR Composite Mile Index has changed little during the last 18 months. It's moved within the narrow limits of 149.2 and 152.4, which are based on average prices during 1925-29 as 100. The latest value is 149.4, very close to the lower limit of this range.

A 3.2% decline in bids on structural steel was the sharpest change among bid items dropped 2.1% on structural concrete, 1.9% on concrete pavement and 0.9% on reinforcing steel.

(Continued on page 197)

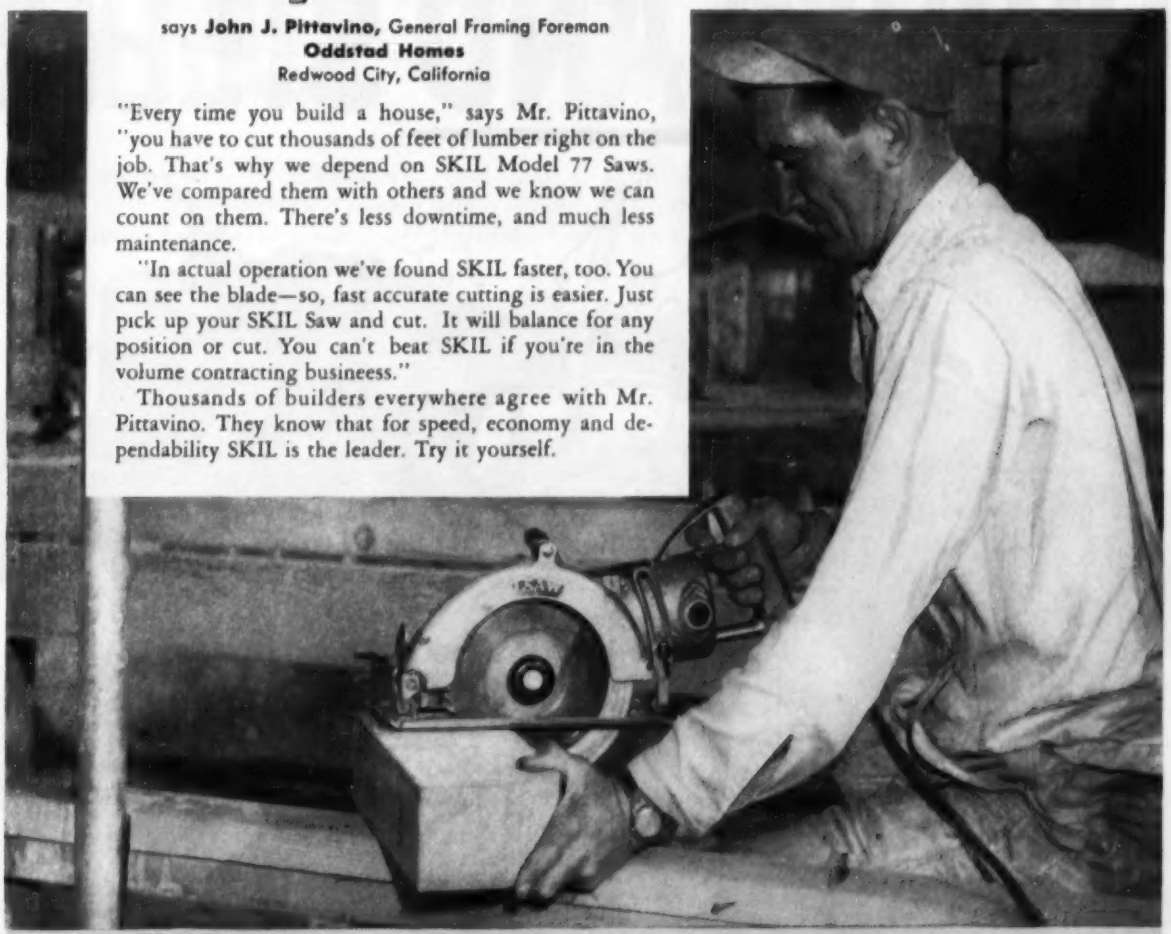
"We Depend on SKIL to Carry the Load in the Field"

says **John J. Pittavino,** General Framing Foreman
Oddstad Homes
Redwood City, California

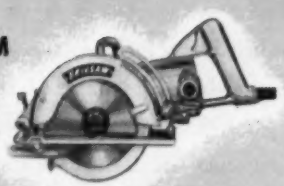
"Every time you build a house," says Mr. Pittavino, "you have to cut thousands of feet of lumber right on the job. That's why we depend on SKIL Model 77 Saws. We've compared them with others and we know we can count on them. There's less downtime, and much less maintenance.

"In actual operation we've found SKIL faster, too. You can see the blade—so, fast accurate cutting is easier. Just pick up your SKIL Saw and cut. It will balance for any position or cut. You can't beat SKIL if you're in the volume contracting busineess."

Thousands of builders everywhere agree with Mr. Pittavino. They know that for speed, economy and dependability SKIL is the leader. Try it yourself.



CHOOSE FROM THESE TWO SUPER-DUTY MODELS!



	New SKIL Saw 77	New SKIL Saw 825
depth of cut at 45°, inches.....	1⅞	2⅛
blade speed no-load r.p.m.	4500*	4000*
net weight, lbs.....	15½	16½

*slow speed of 1300 r.p.m. and high speed of 5700 r.p.m. available at extra cost of $15.00

Model 77 less case.....$112.50
Model 825 less case.....$134.00

LOOK AT ALL THESE SKIL FEATURES

- **LONG LIFE** — All Ball Bearing
- **CONVENIENT!** — Full Size Top Handle
- **VERSATILE!** — Foot Design Permits Right or Left Cuts
- **SAFER!** — Telescoping Guard
- **CONTROL!** — In-Line Rear Handle
- **ACCURATE!** — Blade Visible at Cut
- **CLEAR SIGHTING!** — Effective Sawdust Blower
- **HIGH TORQUE—** — SKIL Worm-Drive Gearing

SKIL PORTABLE TOOLS

Made only by SKIL Corporation formerly SKILSAW, Inc. 5033 Elston Avenue, Chicago 30, Illinois Factory Branches in ALL Leading Cities

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☐ Have a salesman call to make a demonstration.

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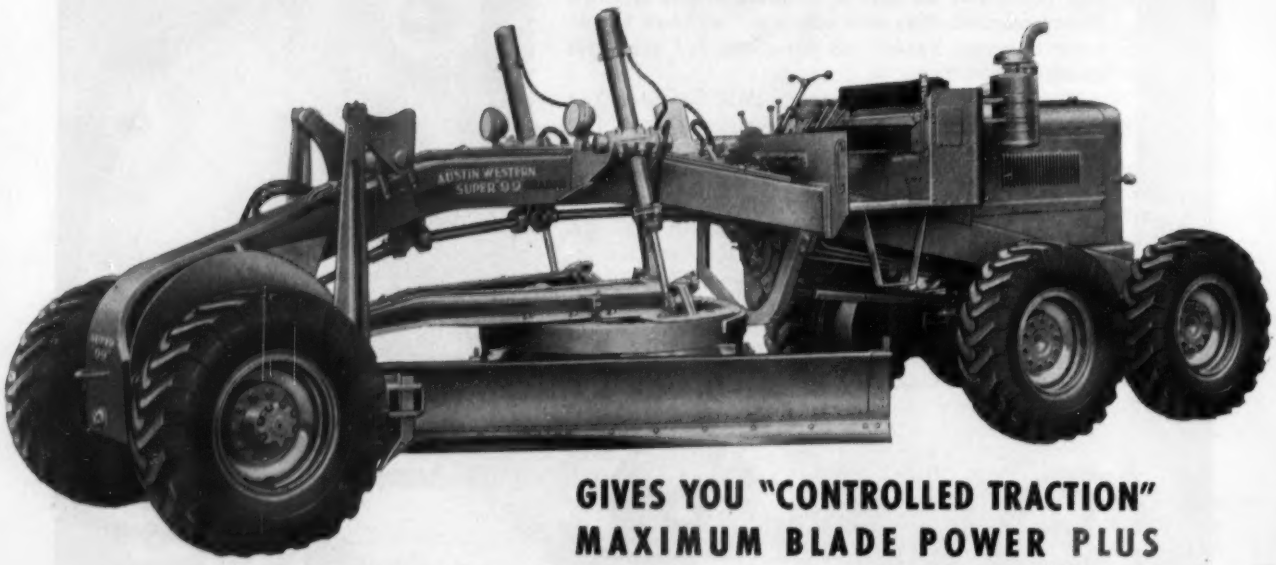
NEW SUPER "99"

DRIVES AND STEERS



GIVES YOU "CONTROLLED TRACTION" MAXIMUM BLADE POWER PLUS TWICE THE MANEUVERABILITY

Whatever the job . . . whatever the ground conditions . . . your best buy in its class is the complete Power Grader, the new, big Super "99." With exclusive All-Wheel Drive for 30% greater Power-at-the-Blade; exclusive All-Wheel Steer for 100% greater Maneuverability, and exclusive "swing that rear-end" Controlled Traction for moving more material, farther and faster, the new Super "99" Power Grader with its six driving and steering wheels will outperform ordinary front steer motor graders, definitely and completely.

A-W POWER GRADER
ON ALL 6 WHEELS

The new Super "99" is the result of a combination of advanced engineering and research, skilled manufacturing and years of practical field experience. Four driving, steerable wheels at the rear team up with the live climbing power of Austin-Western's famous front truck to provide the ultimate in powered flotation.

Austin-Western

Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

HARD HITTING TEAMWORK

...I-R Style

I-R WAGON DRILLS powered by GYRO-FLO Compressors make an unbeatable

CONTRACTORS' COMBINATION

CARSET JACKBIT

Above you see a battery of eight Ingersoll-Rand Wagon Drills putting in 20 foot deep, 2¾ inch, near horizontal holes, in a 28 foot rock cut. Sustained full air pressure was provided by 600-cfm Gyro-Flo portable compressors shown in inset.

The recognized superior slugging and hole cleaning power of Ingersoll-Rand X71WD Wagon Drills made them first choice for this recent major highway construction job. Gyro-Flo Rotary Compressors were used throughout because they provided air power at rock bottom costs. With no valves, pistons, rods or clutch to wear, maintenance is reduced to a minimum.

Ask your I-R representative about the many extra-value features of this cost-cutting combination. He can supply everything you need for drilling rock—from the Carset Jackbit all the way back to the compressor.

Ingersoll-Rand

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JACKHAMERS • PAVING BREAKERS • DRILLMASTERS • QUARRYMASTERS • CARSET BITS • AIR TOOLS

THE BUFFALO-SPRINGFIELD K-45 KOMPACTOR

How to select compaction equipment

The logical question to ask yourself when you are ready to buy new compaction equipment is: "Exactly what do I need the equipment for and how will I use it?"

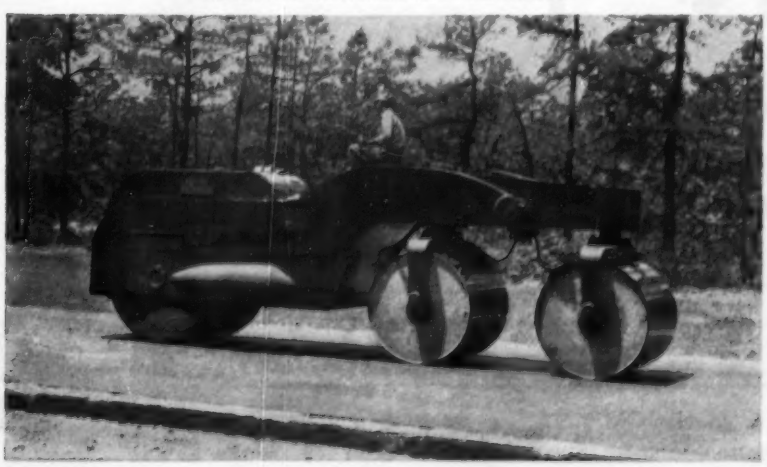
BASE FILL COMPACTION—This type of compaction demands equipment that will handle a wide variety of materials, give you the highest degree of compaction with the fewest passes. Buffalo-Springfield's revolutionary K-45 Kompactor is proving a real money-making answer for this type of work. It is self-propelled, relies on the "Interrupted Pressure Principle." All compaction effort is directed downward. Contractors testify they are meeting density requirements in one-fourth the time normally required with other compaction equipment.

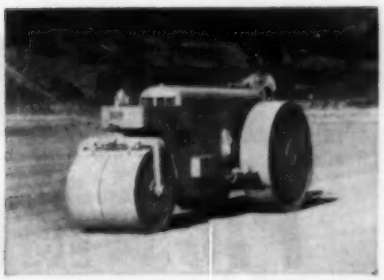
FINE GRADE FINISHING — Buffalo-Springfield offers six 3-wheel rollers, ranging in capacity from 5 to 15 tons, to handle the large variety of materials found in fills, subgrades and unfinished bituminous pavements. The variable-weight 3-wheel roller is ruggedly built for years and years of hard, maintenance-free work.

Buffalo-Springfield's thoroughly-proved 3-axle tandem "walking beam" roller provides up to 60% greater tonnage compacted per day in superhighway construction, airport and military establishment jobs where specifications are extra strict.

ASPHALT FINISHING — Two-axle Tandem Rollers are designed especially for all surface finishing jobs. Ranging from 5 to 16 tons, Buffalo-Springfield Tandems are used for

THE BUFFALO-SPRINGFIELD KX-3 AXLE TANDEM





3-WHEEL ROLLERS

heavy-duty highway and public works projects, and all types of finishing, maintenance and repair work. A wide selection of models for the biggest to the smallest jobs are designed for long-life and profitable operation.

TWO AXLE TANDEMS

SHORT ROLLING JOBS—Buffalo-Springfield's 3-5 ton portable roller is widely used for rolling driveways, sidewalks, parking and playground areas, and for patching and light fin-

3-5 TON PORTABLE TANDEM

ishing jobs. It is highly maneuverable and portable from job-to-job. Write today for full information on the type of equipment you need—or see your nearest distributor for an on-the-job demonstration.

The Standard *of Comparison*

BUFFALO SPRINGFIELD

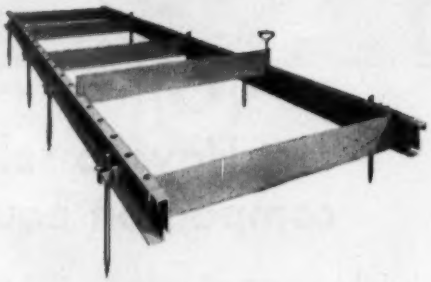
SPRINGFIELD, OHIO

HEADQUARTERS
Plus Improved Standards

SUPERIOR ROAD FORMS

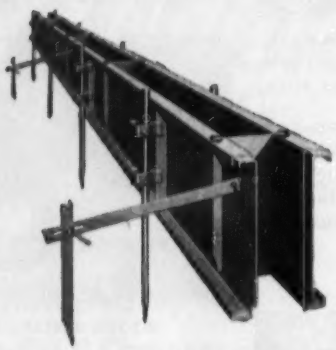
The original superior road form. Hundreds of miles of this form are in daily use throughout the nation. Available with or without flange in sizes to suit customer requirements.

SIDEWALK FORMS



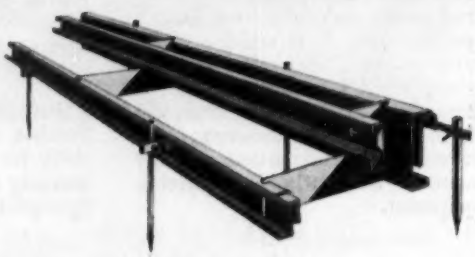
The favorites of more contractors than any sidewalk form. Sturdy, built for years of wear—they go down fast and strip easy. Rerolled rail stakes with adjustable wedge pockets.

CURB FORMS



A complete line of curb forms for every style and size. Give us your job dimensions and we'll suggest the form to suit exact requirements.

CURB AND GUTTER FORMS



Here's the finest curb and gutter form made today. A single base set of Helco curb and gutter forms can be made to conform to just about any curb and gutter style known. The one real all-purpose unit.

• OTHERS INCLUDE ISLAND FORMS, PILE FORMS, RIGID AND FLEXIBLE RADIUS FORMS, FOUNDATION FORMS

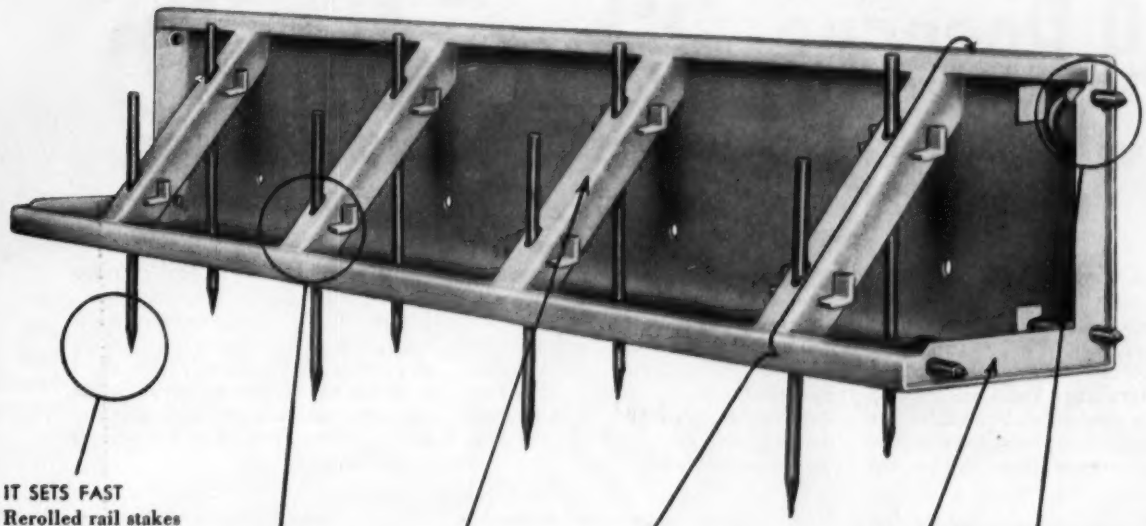
HELTZEL

THE HELTZEL STEEL FORM & IRON COMPANY
51000 Thomas Road • Warren, Ohio

STEEL FORMS

FROM STEEL FORM
A Great New Dual Duty

Here it is! The last word in dual purpose forms—the all-new Heltzel Dual Duty that is stronger, faster aligning, easier to strip.
Designing around the suggestions of dozens of contractors we have developed a form superior in every way to anything on the market. Initial reports from several jobs in different sections of the nation bear out our contention—it is the best yet.



IT SETS FAST
Rerolled rail stakes with long points that will penetrate rock where necessary.

LOCKED-IN ANGLE WEDGES
Wedges of angle steel for greater strength. Upturned end retainers keep wedges in channel.

DOUBLE STRENGTH CHANNEL SECTIONS
Not just stake pockets, but real points of support. By using channel sections form strength is doubled.

EXTRA WIDE TRACK
Full track with generous flange securely welded to channel sections.

FULL SUPPORT ON EACH END
L-section at each end of form keeps face and base at true right angle, also supports tread —prevents form damage where it most often occurs.

DOWEL LOCK FOR FASTER ALIGNING
Pointed dowels at *all three corners* quickly give form setter perfect alignment. It can't fail!

★ Where specifications demand face and base of equal dimensions, Heltzel can furnish single purpose forms of same basic design.

For Your File

Two handy form booklets from which you will be able to select the exact form for any job need. Write today for your copies of K-19 and L-20.

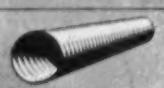
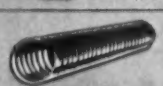
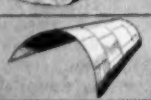
49 Reasons

WHY ARMCO GIVES FASTER SERVICE

Wherever your next job is located, it will probably be only a short distance from one of the 49 plants of Armco Drainage & Metal Products, Inc. This means you can get fast delivery on the Armco Drainage and Construction Products you need. Schedules are easier to maintain; transportation and handling costs are minimized. You can always count on the same high-standard Armco service in every respect.

In addition, there are almost 90 conveniently-located Armco sales offices over the country. Here you will find qualified sales engineers ready to contribute Armco's wealth of experience to help with your drainage and construction problems.

Experienced contractors prefer Armco Corrugated Metal Drainage Structures because they are easily installed without heavy equipment; no special skills are needed for assembly; installed costs are usually lower than for other drainage material. And work goes fast in any season. See chart for designs and sizes.

PRODUCT		SIZES	PRODUCT		SIZES
STANDARD CORRUGATED METAL PIPE		Diameter 8" to 96"	MULTI-PLATE PIPE		Diameter 60" to 180"
PIPE-ARCH		Span—Rise 18" x 11" to 72" x 44"	MULTI-PLATE PIPE-ARCH		Span—Rise 6'-1" x 4'-7" to 16'-7" x 10'-1"
ASBESTOS-BONDED		Includes standard Pipe and Pipe-Arch sizes	MULTI-PLATE ARCH		Span 5' to 30'
PAVED-INVERT		Includes standard Pipe and Pipe-Arch sizes	HEL-COR PERFORATED PIPE		Diameter 6" to 18"

Other Armco products include Liner Plates, Steel Sheeting, Pipe Piling and Pile Shells, Retaining Walls, Guardrail, Bridge Plank, Water Control Gates and a complete line of Steel Buildings. For more data on any product, write us. Armco Drainage & Metal Products, Inc., 3605 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO DRAINAGE STRUCTURES

Bridge Demolition Is Crash Job

INSUFFICIENT SHORING during demolition operations caused the collapse of this 90-ft conveyor-belt housing which spanned New York City's East River Drive. Louis Cioffi, Commissioner of Borough Works, said the collapse came when the contractor cut through the middle of the span. "The two halves didn't have enough support," Cioffi said. "Naturally, when they cut through the middle, down she went." No one was hurt when the 150 tons of concrete crashed to the street at 2:35 am. The contractor, Scala Contracting Corp. of Brooklyn, N.Y., had obtained a city permit closing off the area to traffic from midnight to 6 am while demolition proceeded. But the contractor was charged for damages to the street and adjacent property.

"Road building in an Indiana winter was rough going —but pre-mixed 'Zerex' anti-freeze kept us on schedule and saved us $500!"

says Robert Nelson, Equipment Superintendent, S. J. Groves & Sons Company

"In the beautiful, but frozen, lake country of northern Indiana last winter, we had a hundred and fifty pieces of construction equipment pushing thousands of yards of earth around each day. Our objective? To complete an important 12-mile section of the $283,000,000 Indiana Toll Road."

"Keeping a million dollars' worth of equipment on the job is my responsibility," says Equipment Superintendent Nelson. "I've had 15 years' experience with Groves, here and in Minnesota, where the thermometer sometimes dives to 40° below. Proper anti-freeze protection is important!"

"To protect all our motorized units, we pre-mix 'Zerex' in drums . . . winterize the entire fleet in one operation. Unskilled labor can handle the installation; get uniform protection without waste, so this method saves us $500.00 each winter. And that's not considering the downtime we'd suffer if just one block froze up and cracked."

"Any downtime in our equipment would be plenty costly. That's why it's good to know we can count on Du Pont 'Zerex.'" What does Superintendent Nelson use in his own car? "Zerex" anti-freeze, naturally! Order "Zerex" now in 54-gallon drums for convenience and economy.

DU PONT

ZEREX

REG. U. S. PAT. OFF.

Anti-Rust ANTI-FREEZE

DU PONT

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

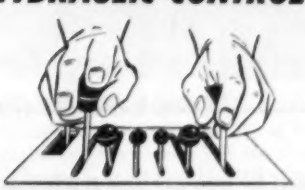
E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON, DELAWARE

K-580 SHOVEL MOVES ROCK FASTER—operator works with greater speed and safety because of greater "live" weight built into every Link-Belt Speeder. All-welded, stress relieved construction gives greater strength per pound. Alloy cast-iron clutch shells assure superior friction, longer lining life. Independent rapid boom hoist has power control up *and* down.

Now every Link-Belt Speeder shovel-crane has *Speed-o-Matic*®

—no lag, no jerk, no strain—

IT'S FULL POWER HYDRAULIC CONTROL



Today Speed-o-Matic controls are *standard equipment* on every size rig in the entire Link-Belt Speeder line! Full power hydraulic control is your key to 25% extra production . . . more consistent profits in the ½ to 3-yard, 6 to 60-ton work range. Here's why:

- REDUCED OPERATOR FATIGUE—fingers, instead of muscles, put full power to work.
- SMOOTHER CYCLES—complete cycle is one fluid motion.
- MORE ACCURATE CONTROL—operator always safely *feels the load.*
- REDUCED CLUTCH ADJUSTMENTS—clutch piston is self-compensating for normal lining wear and heat expansion.
- 150 WORKING PARTS ELIMINATED—maintenance costs cut.

Join thousands of alert owners who are making more money with Link-Belt Speeders. Contact your Link-Belt Speeder distributor for details. LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa.

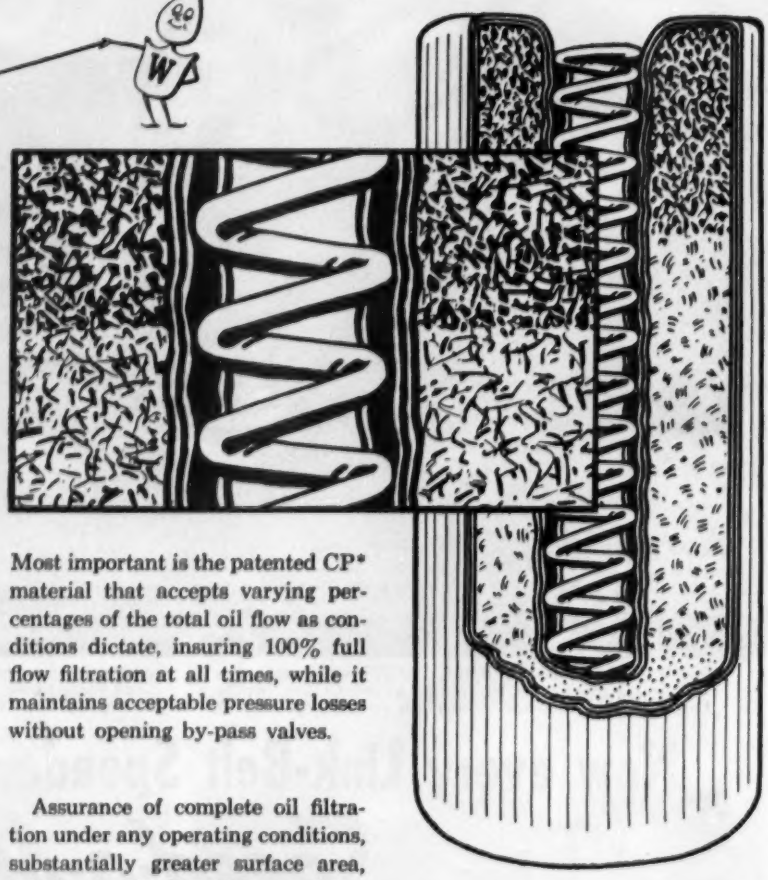
13,731

LINK-BELT SPEEDER

Builders of a complete line of crawler and rubber-tired shovel-cranes

How Much Surface Area is there in this CP* Filter Element?

- ☐ 3 SQUARE FEET
- ☐ 11 SQUARE FEET
- ☐ 16.5 SQUARE FEET



Here's a good tip. The contact area of this CP* element is at least twice as great as the contact area of a surface type filter of equal dimensions.

The greater contact area of the Winslow CP* element results from a combination of effective filtering materials. Every surface of the cotton thread is porous and fluffy for dirt retention; all the area of the cellulose fibre picks up harmful contaminants. These materials are carefully mixed to permit oil flow without packing or channeling of the filtering media. Gums, moisture and varnish are absorbed by the chemically treated fibres.

Longer Useful Life

In the CP* element, oil passes through V-shaped traps in which contaminants are progressively caught, according to particle size. Instead of massing on the outside of surface filters to eventually become impervious, these contaminants gradually fill the V-shaped traps, so that the element has substantially longer useful life.

Most important is the patented CP* material that accepts varying percentages of the total oil flow as conditions dictate, insuring 100% full flow filtration at all times, while it maintains acceptable pressure losses without opening by-pass valves.

Assurance of complete oil filtration under any operating conditions, substantially greater surface area, and longer effective life are advantages of Winslow CP* elements that have been proved by thousands of engine owners. These exclusive advantages can be demonstrated on your engines. Let us give you complete data on filters and elements for your equipment. Please write or call the nearest office.

This is the answer to filter area: The contact area of this Model 935-0 element is composed of cotton thread and cellulose fibre with a total effective filter surface area of 16.5 sq. ft. An average surface type element of this size has an effective area of 7.2 sq. ft.

WINSLOW FILTERS *CP* is fully protected by patents and trademarks*

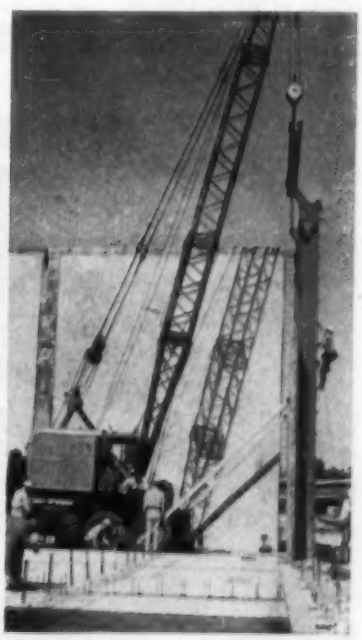
Winslow Engineering Company, 4069 Hollis Street, Oakland 8, California • Eastern Factory: Murray, Kentucky

Construction News in Pictures...

BREAKING RECORDS AT MACKINAC— Contractors for the substructure of the $80 million Mackinac Bridge are breaking their own world's records for underwater concrete placement from floating equipment. Merritt-Chapman & Scott Corp., New York, and Prepakt Concrete Co., Cleveland, placed 6,250 cu yd in one 24-hr period and 24,181 cu yd in a 5-day run. The old records were 5,040 cu yd in 24 hr and 20,559 cu yd in 5 days. Photo shows simultaneous placement of crushed rock aggregate and intrusion mortar on one of the main suspension tower piers. Flexible pumping lines permit operations to continue in rough weather.

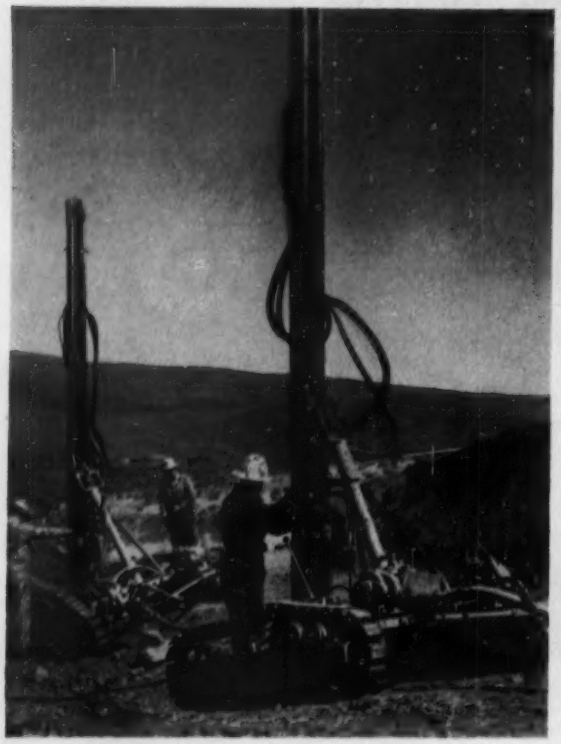
(More photos on next page)

WORKING IN REVERSE—This loose fill embankment is too steep for the Allis-Chalmers HD-21 tractor to climb, so the operator takes it up to the top by road, swings around and backs down with the dozer blade dragging to smooth the fill on the bank. The tractor is working on the Santa Felicia Dam, Piru Creek Canyon, Ventura, Calif. The dam will contain 4,000,000 cu yd of earth fill. It will be 200 ft high above the bed of the stream, and its foundations will go down 90 ft to bedrock. The dam is primarily for flood control and reservoir storage. Contractor is D&H Construction Co., Piru, Calif.

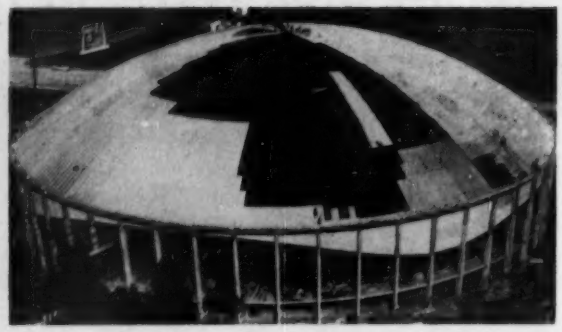


TILT-UP AID— A special lifting frame helped place tilt-up panels for the Shoreline High School in Seattle, Wash. The 40-ton panels in position (left) are the largest erected in the Pacific Northwest. Kenneth P. Norrie, Spokane consulting engineer, designed the lifting frame.

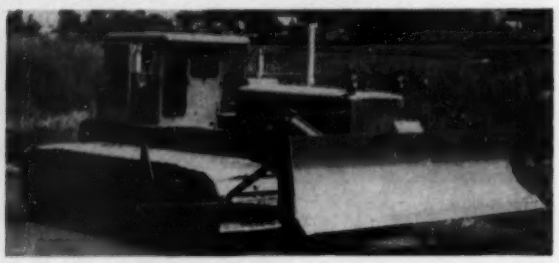
Construction News in Pictures . . . Continued



NO SWEAT OR STRAIN — On a railroad relocation job near The Dalles, Ore., Morrison-Knudsen Co. is using drills mounted on tracks driven by compressed air motors. Operators are relieved of the back-breaking and sometimes dangerous work of moving drills manually. The rig is called Air-Trac Drill Carrier and is manufactured by Gardner-Denver Co. of Quincy, Ill.

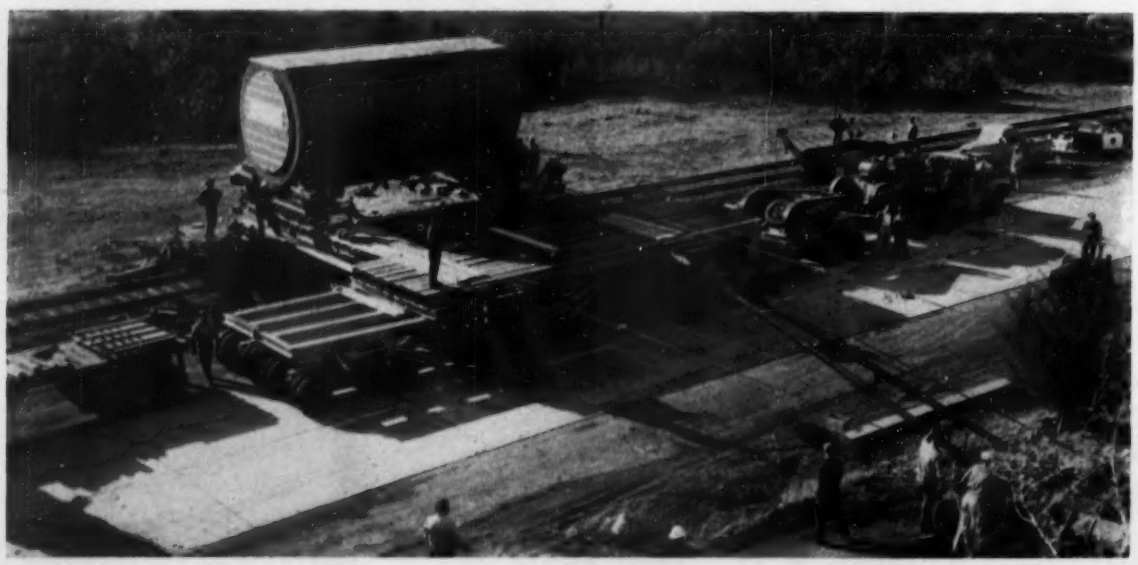


SHINY DOME — Coliseum at Charlotte, N. C., is topped with 3,665 pieces of aluminum welded together. Dome rises 120 ft above street level. Aluminum cap rests on a steel-ribbed web frame stretching from a steel tension ring around the circumference to a central compression ring and overlaid with preformed concrete. General contractor is Thompson and Street of Charlotte.



DEEP FREEZE CAT — Seabees will operate low-ground-pressure D8 tractors like this one to construct bases and airfields next winter in Operation Deep Freeze, Admiral Richard E. Byrd's next expedition to the Antarctic. The tractor has 54-in. track shoes and creates a ground pressure on only 4 lb per sq in. Caterpillar Tractor Co. is building 10 for the expedition.

(More news photos on page 45)



RECORD LOAD — Heaviest load ever trucked along a California highway was this 224-ton stator for a turbine generator at the new Morro Bay steam electric plant of Pacific Gas and Electric Co. near San Luis Obispo, Calif. The stator was carried on a low-bed truck consisting of a 200-hp tractor and four interjoined dollies. The truck had an over-all length of 89 ft and a total of 82 pneumatic-tired wheels. It weighed 52 tons. Trucking distance from railroad siding to plant was less than 10 mi, but the job required eight days of three-shift work. To safeguard the highway, 3x12 planks were laid along the route and heavy beams placed to buttress culverts and bridges. Bechtel Corp. engineered and constructed the Morro Bay plant.

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FOR EASY HANDLING ON TOUGH JOBS . . .

and get "More Use per Dollar"

Select a light weight hose construction that is flexible and kink resistant for long-life dependability.

Hose that is light in weight—yet strong enough to safely withstand high pressures—is easier to handle. Men like it better and do more work with it. Look for a hose that is light, yet strong, for ease of handling.

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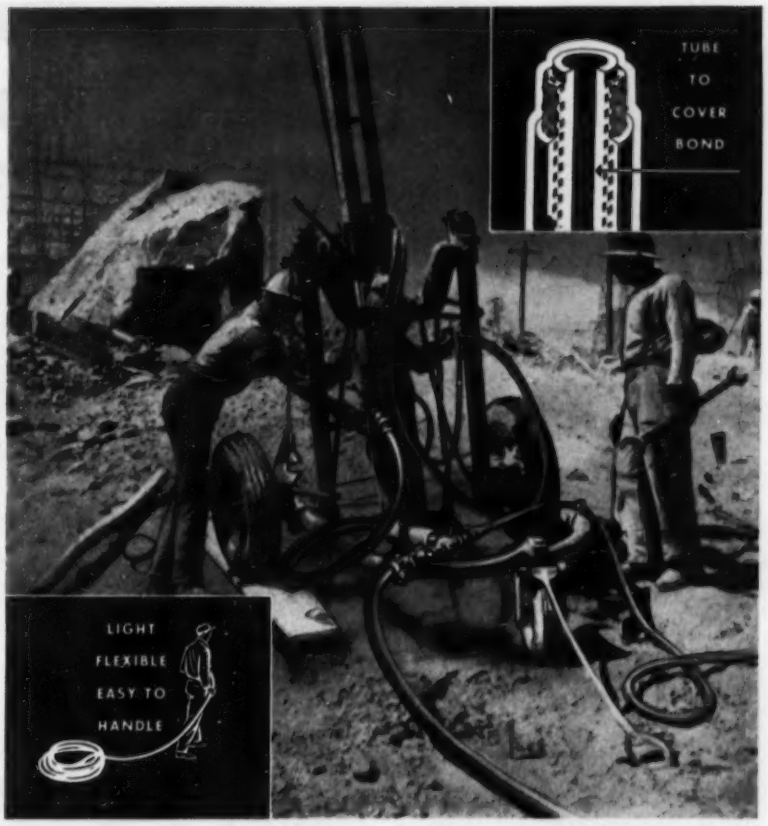
Make certain the hose is engineered for maximum flexibility . . . from tube to cover. Tube-to-cover flexibility prevents separation of cover, tube or strength member plies . . . reduces hose costs by increasing hose life.

Specify the one hose that gives you all these features . . . specify R/M Homoflex Hose.



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Ask your R/M representative about types of Homoflex Hose for your operations. He can also tell you why other types of R/M Hose for general and special purposes last longer, too . . . give you "More Use per Dollar".

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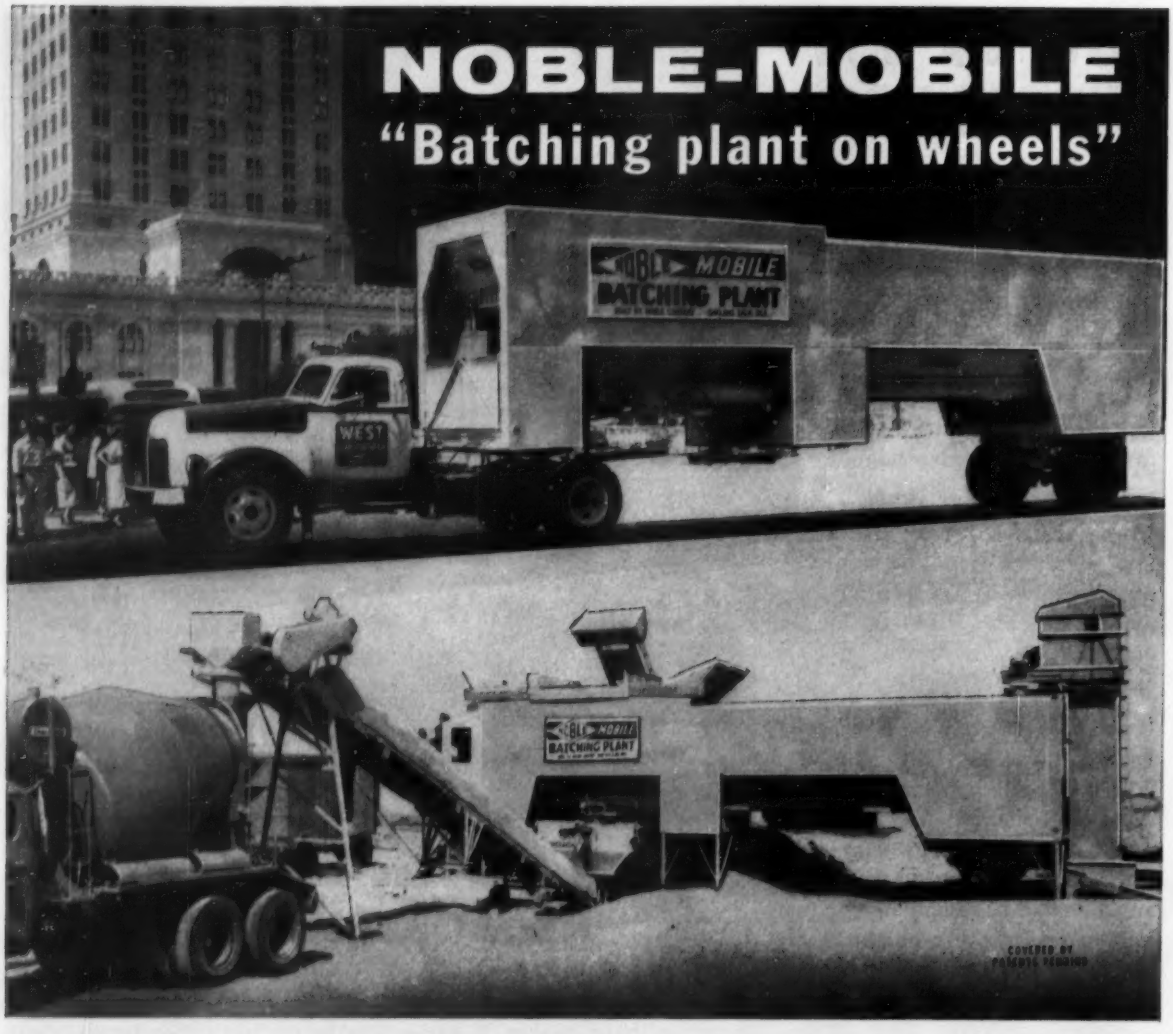
"Batching plant on wheels"



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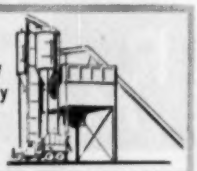

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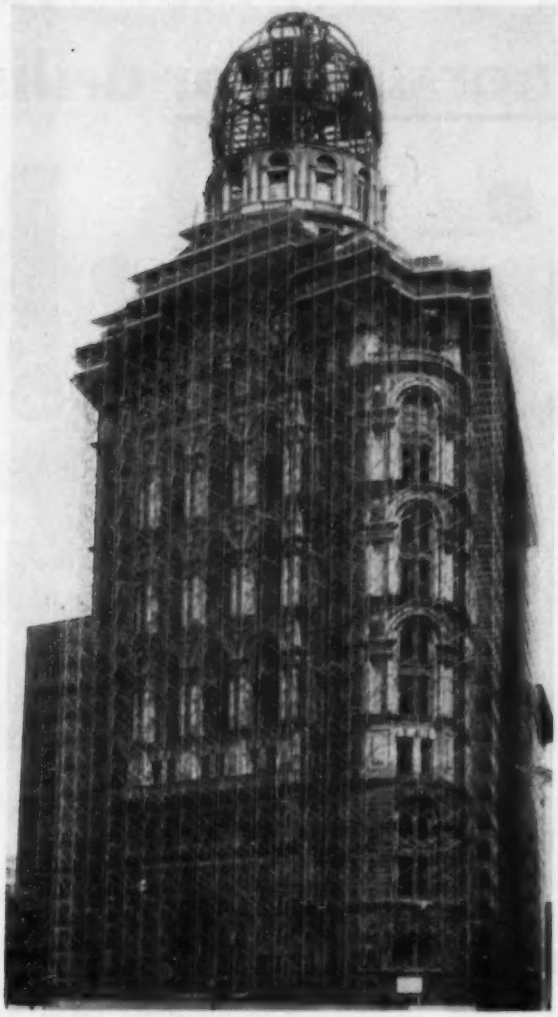

FRAMED LANDMARK — New York's famed Pulitzer Building is encased with 3,500 6½-ft high Trouble Saver sectional scaffolding frames set 6 ft apart as demolition starts on the 13-story structure to make way for office building.

TESTING A BEAM — A concrete beam with curved pretensioned and prestressed reinforcement is tested under the weight of cinder blocks at the University of Miami where it was developed. Blocks are water-soaked for additional weight.

TUNNEL PLUGGING — Mix is delivered by Mack Truck and Marion crane to Pumpcrete machine to plug diversion tunnel of California's Folsom Dam. Mix is pumped 1200 ft to 2nd machine, relayed 500 ft to bulkheads. Merritt-Savin are contractors.

TEAM WORK — Large concentration of heavy equipment works to complete Newark Bay crossing of New Jersey Turnpike. Two-derrick traveler works on the east approach and a smaller traveler works on arch span. Traveler and barge with 138-ft tower and 35-ton stiffleg derrick work on west side. With approaches, the bridge is 9,560 ft long and contains 25,000 tons of steel. Bethlehem, superstructure contractor, will erect another 11,000 tons of steel for a viaduct connecting with the west approach.

One of the many important tunnels driven by Gardner-Denver drills

Exclusively!

Project: The Eucumbene-Tumut Tunnel Project for the Snowy Mountain Hydro Electric Authority of Australia.

Contractors: Kaiser-Walsh-Perini-Raymond.

Tunnel Data: The longest tunnel ever worked on a single heading —24 x 24 feet. A record performance of tunnel advancement of 402 ft. in 6 working days.

Gardner-Denver Equipment on the Job: 12 Gardner-Denver CF93 Drifters mounted on 4′ Slides. All machines mounted on Gardner-Denver Hydraulic Booms.

Find out why Gardner-Denver equipment has been first choice for more than 600,000 feet of major tunnel drilling throughout the world in the last five years alone.

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Gardner-Denver CF93 Drifters, on Gardner-Denver Hydraulic Booms, at work in the Eucumbene-Tumut Tunnel.

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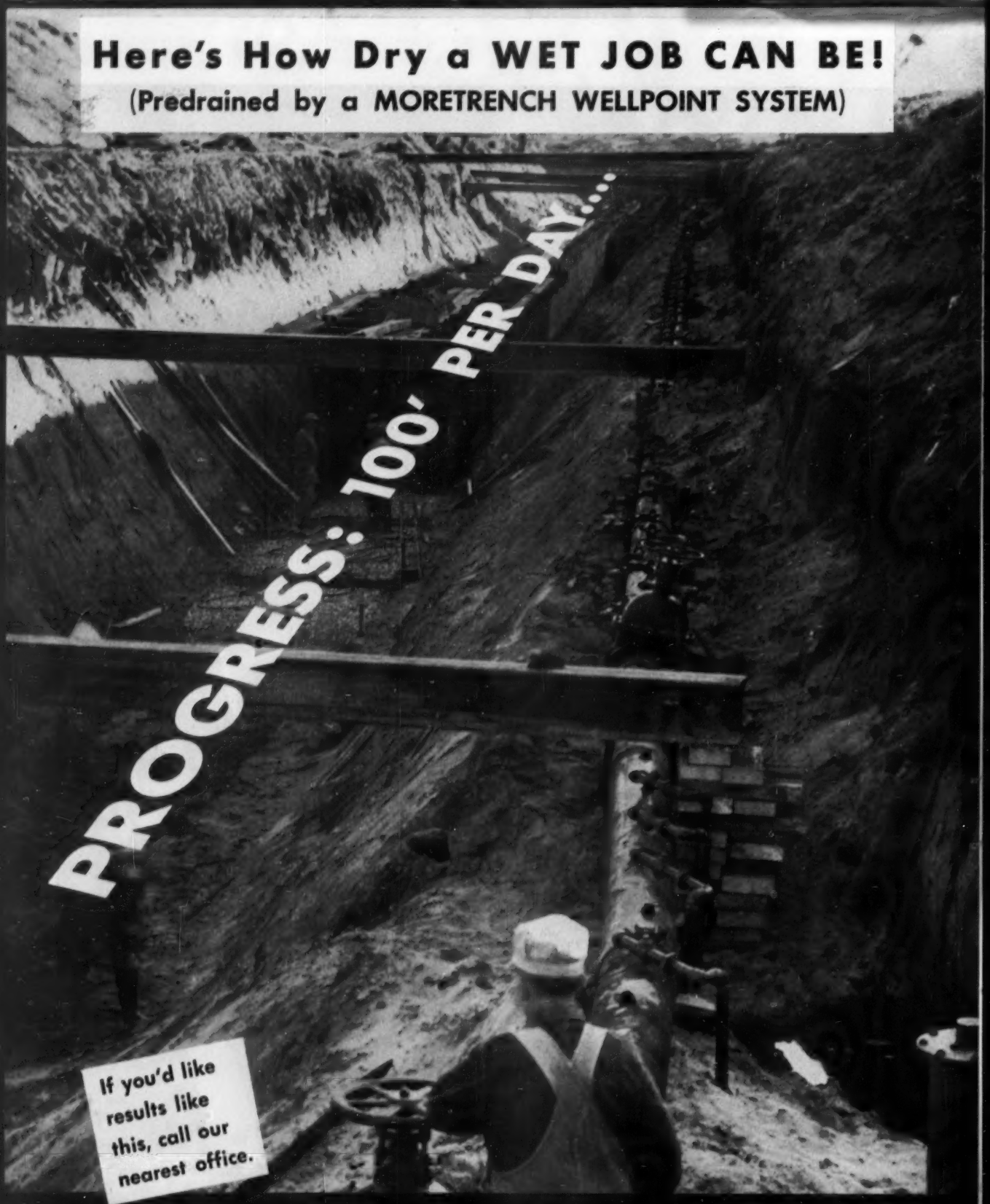
(Predrained by a MORETRENCH WELLPOINT SYSTEM)



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SEPTEMBER, 1955 • VOLUME 37 • NUMBER 9

HENRY T. PEREZ, Editor

CONSTRUCTION METHODS AND EQUIPMENT

An Invitation to Disaster

IT'S A SHAME it takes a major disaster to awaken the nation to the folly of postponing needed public works. But that is hurricane Diane's cruel lesson. Heavy rainfall around the fringes of the hurricane last month caused floods in the northeastern states that cost at least 186 lives and property damage estimated at more than $1.6 billion.

Would additional dams, dikes and other flood control projects have prevented such a disaster? Some responsible opinion holds that no practicable amount of facilities would have done much to prevent such a disaster.

Lt. Gen. Samuel D. Sturgis, the Army's Chief of Engineers, takes an opposite view. He estimates that just the projects Congress authorized some 10 years ago—but failed to appropriate funds for—would have cut losses by $70 million. Cost of those works: $103 million, as figured in 1951 when the most recent estimates were made.

And Gen. Sturgis believes that an additional $150 million in control works would have contained the flood. That seems a relatively small price to pay to prevent such loss of life and property. Why have we been unwilling to pay it?

Public apathy is partly responsible for the lack of follow-through on flood control projects. Many needed projects simply have gone by default. In other cases, active opposition to projects has come from those who stand to benefit most, the residents and industry of the area. Local reluctance to provide the land and easements necessary for flood-control works has been an important reason why needed improvements have not been built.

But Congress can't avoid its share of the blame. Its failure to vote funds for the flood control projects it had authorized is on a par with its failure to act constructively on legislation for other vitally needed public works.

Take highways, for example. Highway accidents claimed 313 lives over the last July 4th weekend alone. The total killed on the nation's roads last year was more than 38,000. It's a reasonable estimate that inadequate highways cost this nation upwards of $5 billion annually.

Construction of adequate highways will not eliminate completely this dreadful toll. But it will reduce it substantially. No responsible member of Congress now questions the need for better roads. All agree that lack of an active, long-range program for accelerated highway construction and modernization is one of the nation's foremost problems. That makes the failure to provide new highway legislation even more shocking.

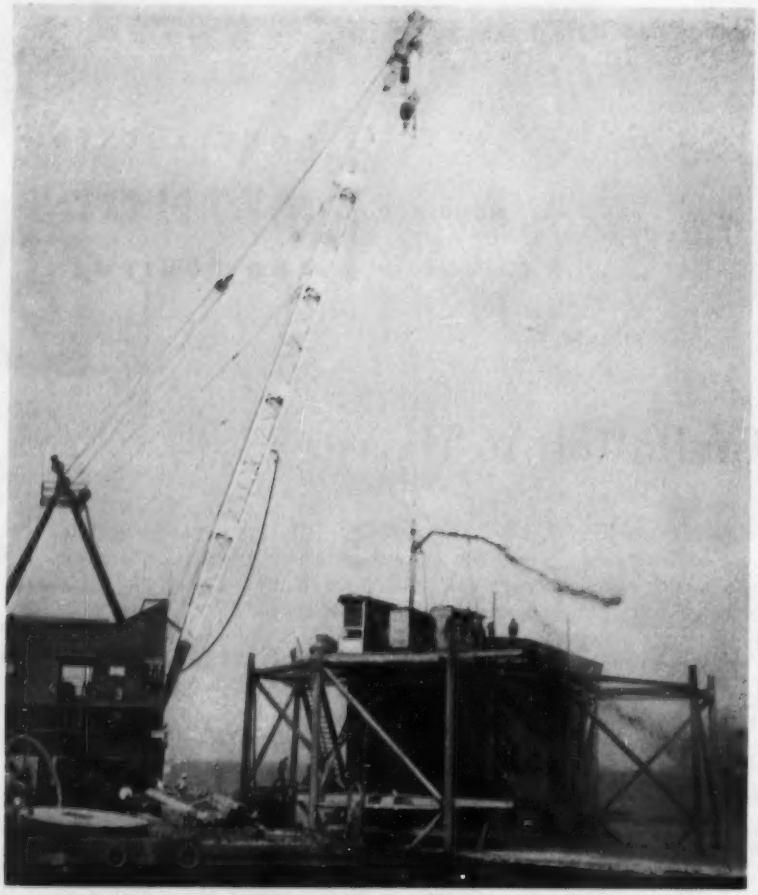
There were three separate highway plans under consideration in the last session of Congress. They all foundered on the shoals of partisan politics or lobbyist pressure. And now there is talk that no highway bill can be enacted in 1956 because of Congress's traditional timidity about raising taxes in an election year.

Well, the lawmakers could not be more wrong if that is their judgment of public opinion. The highway user is willing to pay for better roads. Any doubt that he realizes the value of up-to-date traffic facilities can be dispelled by a look into the collection booths of toll roads now in service. Operators of both private and commercial vehicles daily are paying extra for the privilege of driving on good roads. Intelligent highway users will not object to paying appropriate taxes to build modern highways—providing those taxes are used to build highways and not diverted into other channels.

Perhaps what is needed most of all is active public support for these vital public improvement programs. Last month's floods certainly demonstrated once again the high cost of public indifference and procrastination in Congress. By now it should be clear that we invite disaster when we fail to build the flood control projects, highways, schools and other public facilities the nation needs.

Capping Bottoms of

by ALBERT C. SMITH
Associate Editor



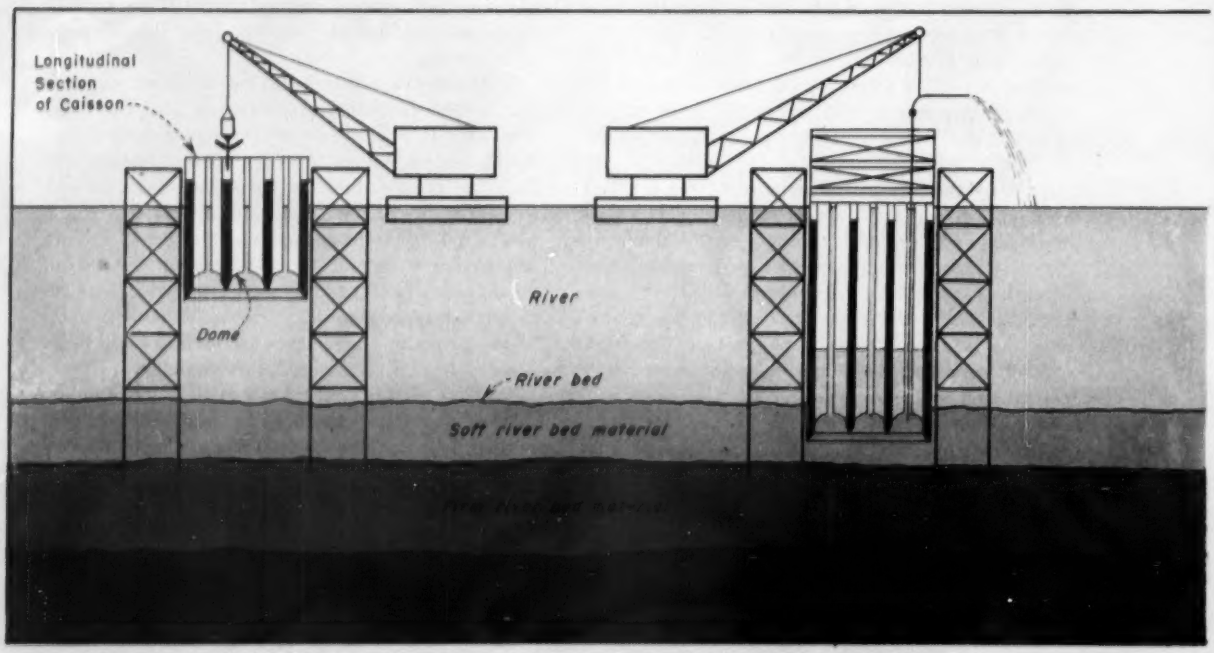
BRIDGE CAISSON slowly sinks into river bed as air-lift dredges out underlying muck through wells. Welding equipment set on guide frame is used to erect walls and wells.

CONTROLLING CAISSON BUOYANCY with free air and bottom dredge-well domes is saving time and money on Virginia's new Rappahannock River Bridge.

Diamond Construction Co. of Savannah, Ga., has tossed out the conventional method of capping the tops of the wells and pumping compressed air inside. They fabricate removable domes right into the cutting-edge section.

The method has several advantages. First, it allows the cutting edges to float much higher, making it possible to tow them in shallow water without dredging a channel. Second, it is cheaper because it eliminates the need for maintaining compressed air crews round-the-clock. And third, it is safe and simple. There is no danger of losing a caisson because of an airline failure. And buoyancy is easily controlled by pumping water into the wells.

Caisson sinking is tricky. Steel and concrete are gradually added on top as the unit sinks. In water,



DOMES OVER DREDGE WELL BOTTOMS provide maximum buoyancy as caisson gradually sinks through water. One foot of concrete added on top makes caisson sink 2 ft.

AIR-LIFT DREDGES muck through pipes. As caisson sinking is slowed by muck, water is pumped into closed dredge wells to add extra weight. Cofferdam and bracing are secured to top of caisson.

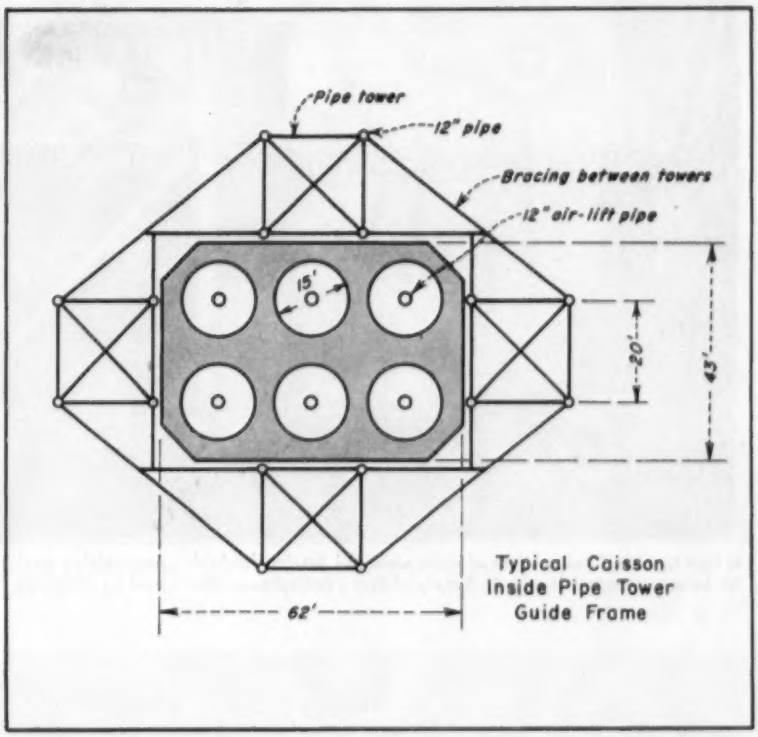
Dredge Wells Helps Control Caisson Buoyancy

every foot of concrete makes the caisson sink 2 ft. But when it reaches the riverbed, its movement is slowed by soft mud. Extra weight is then added by pumping water into the closed dredge wells. At the same time, mud is air-lifted out through 12-in. pipes that are connected to the domes.

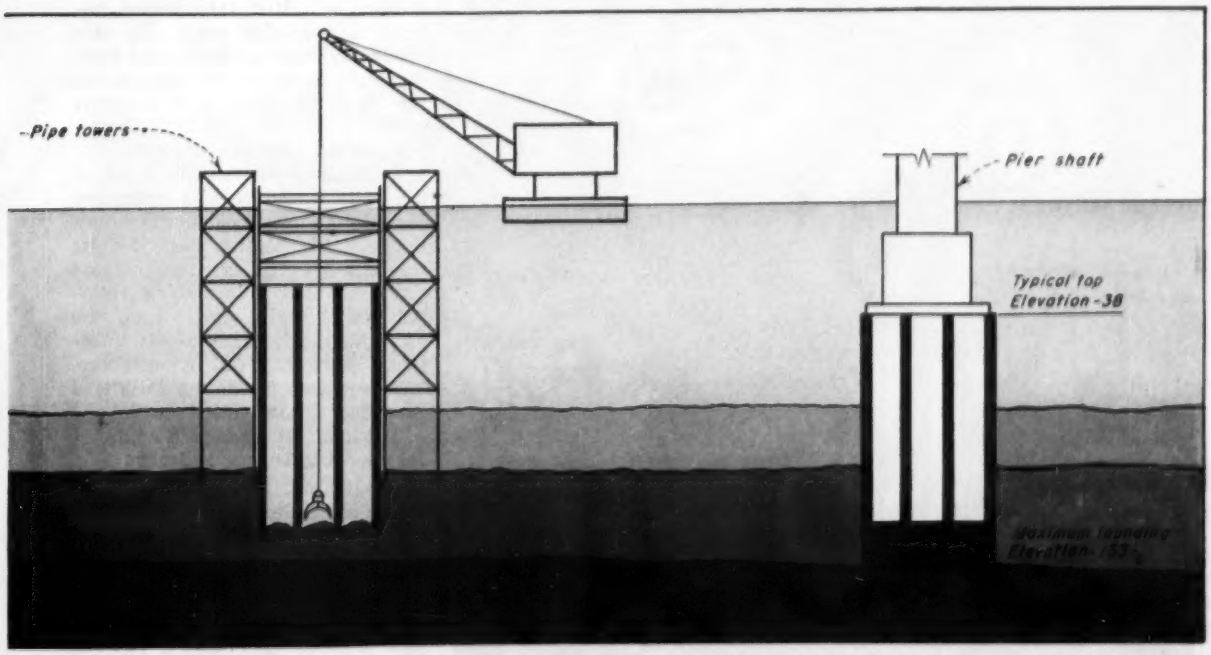
Eventually, the caisson sinks to a depth where its weight is completely supported by firmer material. Then, buoyancy control is no longer needed, and the domes are removed by divers. Clamshells, aided by jets projecting from sounding wells, take over dredging until the caisson finally reaches firm bearing sand. Its bottom 15 ft is then sealed with tremie concrete.

The bottom-dome method will help sink a total of 15 open-dredged caissons. Largest caisson is 62x43 ft, and the deepest will be sunk to elevation –153. All caissons have six dredge wells, varying from 12½ to 15 ft in dia.

Caissons will support a high level steel arch span, two anchor arms and twelve deck truss spans. Trestle approaches on each side are on concrete pile bents. Located only 5 mi from the river's estuary

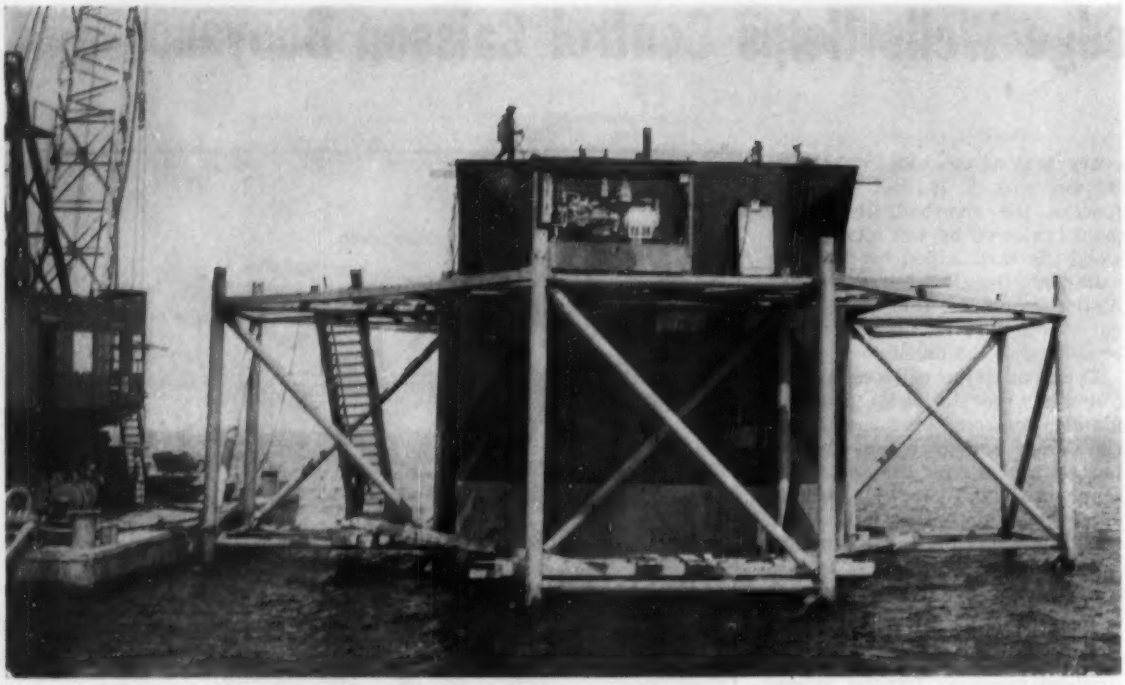


PIPE TOWER ASSEMBLY guides caisson to bottom. It consists of four towers nearly 100 ft long pinned to river bed with pipe piles. Steel yokes connect towers.

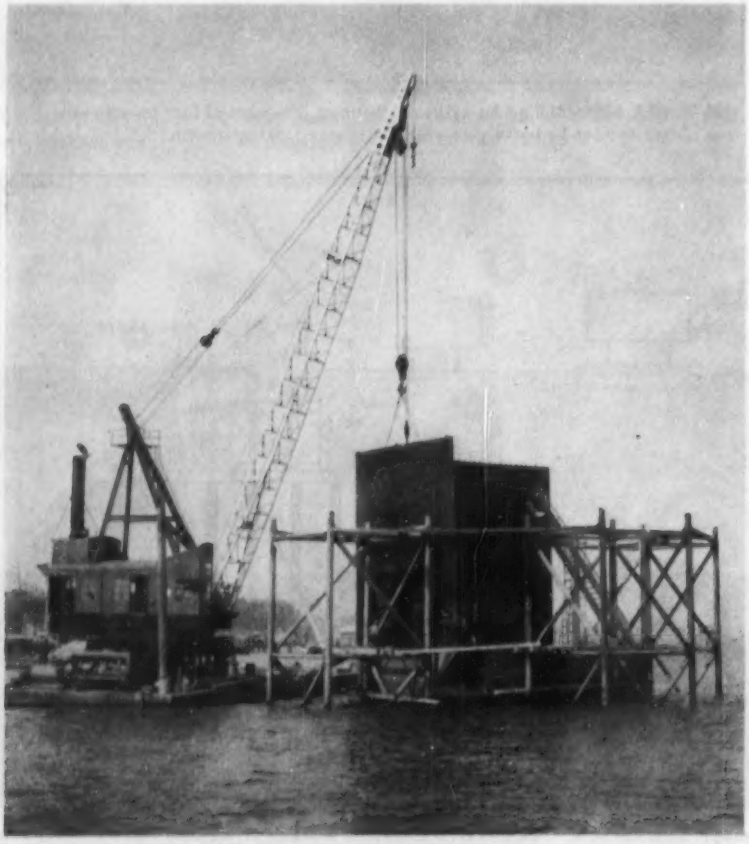


CLAMSHELLS, aided by jets projecting through sounding wells, dredge firmer material as caisson sinks to founding elevation. Domes are removed by divers when buoyancy control is no longer necessary.

COMPLETED CAISSON is sealed at the base with tremie concrete. On top, distribution block and bottom of shaft are poured in the dry within steel cofferdam. Job requires 15 caissons.



WELDERS ERECT top sections of walls, wells and bracing for final lift before cofferdam is added. Battery of four Westinghouse 400-amp welding machines is mounted on guide frame. Units are powered by Caterpillar diesel-electric set.



COFFERDAM WALLS made of heavily reinforced steel plate are secured to top of caisson. When bracing is placed inside, sinking operation will resume until caisson is founded.

at Chesapeake Bay, the bridge is nearly 2 mi long.

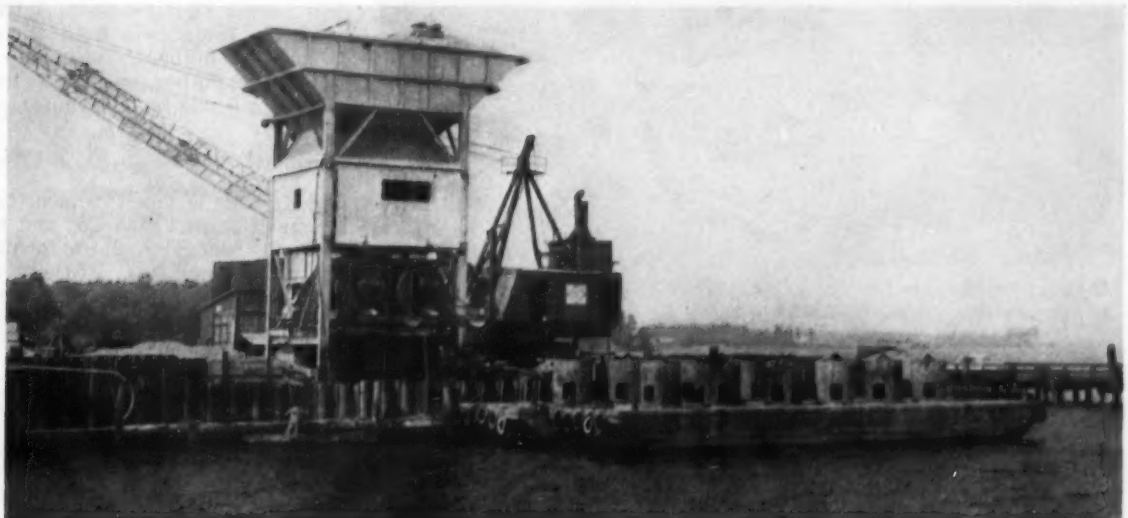
Before any caissons could be sunk this summer, Diamond had to do considerable preparatory work at the site. His cost-cutting plan called for doing most of his own fabrication. But this would require a good-size yard. He also needed substantial docks and shelter areas to tie up his big floating rigs and to support a concrete plant.

Diamond had another problem, too. Shallow water over most of the area would require extensive dredging to permit adequate movement of his floating rigs. So, he solved both problems at the same time. He dredged working channels for his rigs and placed the material inside a sheet-pile bulkhead extending out from shore. When it was filled, the bulkhead provided a yard 150 ft wide and 450 ft long. It also acted as a pier for mooring barges and rigs.

Steel Fabrication

Except for the cutting edges, all fabrication is done by the contractor at the yard or right on the caisson. The cutting edges are fabricated at Newport News, Va., and towed to the site. Steel bracing, wall and well sections for the caissons are prefabricated in the yard

CONTRACTOR'S YARD adjacent to bridge serves as fabrication area, pier for floating rigs and support for concrete plant. Diamond built yard by dredging working channels for his rigs and pumping fill into sheet-pile enclosure.



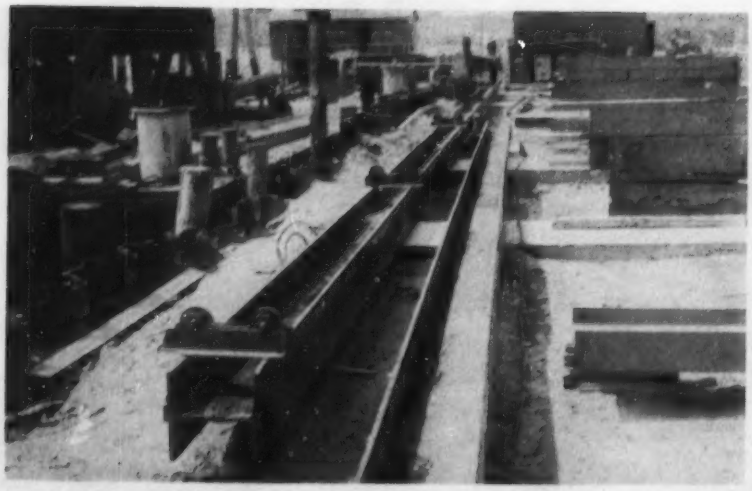
CONCRETE PLANT at end of yard consists of Johnson batch bins and two Koehring 2-yd mixers. Mix is chuted directly into 2-yd buckets carried on barges. Each barge holds six buckets. Batch bins are charged by Whirley crane handling clamshell bucket.

and towed out to the caissons for erecting. It takes about a week to place bracing, then walls and finally wells for a 30-ft lift. And it's practically all done by welding. Diamond keeps at least eight welding machines busy in the yard and 12 on the caissons.

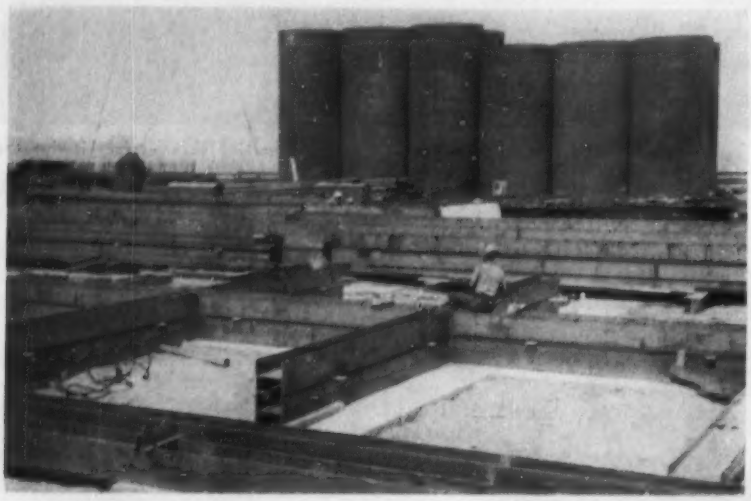
Each caisson requires a battery of at least four 400-amp Westinghouse welding machines. Diamond mounts them on the guide frame surrounding the caisson and powers them with a Caterpillar 75-kw diesel-electric set.

Besides the caissons, Diamond fabricates the steel frames that guide the sinking of the caissons. Frames consist of 20-ft square steel towers made of 12-in. pipe and braced with angles. They vary up to 100 ft in length. A complete unit consists of four towers, one at each face of the caisson, connected by steel yokes.

Before a caisson is brought out, three towers are set in place and pinned with pipe piles. The caisson is then floated into the opening, and the fourth tower is pinned in place. Pipe piles next to the caisson faces have a channel welded along the entire length to help



ROLLER JIG mounted on heavy beam in fabrication yard speeds splicing of pipe sections. Pipe is big item on job. It is used for towers, piles, sounding wells and air-lift tubes.



INTERNAL COFFERDAM BRACING is fabricated on concrete work platforms. In background, tall dredge well sections wait to be carried out to caissons and welded in place.

CUTTING EDGES float next to yard. When a 30-ft lift of walls, wells and bracing is added to each, they will be towed to site and sunk. Fabricating on site cut costs for contractor.

guide the caisson as it sinks. Towers are reused about four times.

Concrete is made in a plant set up at the edge of the yard. Two barges carrying six 2-yd buckets each shuttle between the concrete plant and the caisson. Concrete is batched in a Johnson batcher, mixed in two 2-yd Koehring mixers and chuted directly into the buckets. At the caisson, buckets handled by floating cranes dump into a group of hoppers that distribute the mix evenly to equalize loading on the caisson. The pour is made in three 10-ft lifts, spaced two days apart. A 10-ft lift requires about 270 yd.

When the caisson is finally founded and sealed, the cofferdam on top and the dredge wells are dewatered. A distribution block then is poured in the dry over the caisson. Pier shafts are built next, and then the cofferdam is removed and reused.

Major equipment on the job includes one 50-ton floating Whirley, one 45 and four 30-ton rigs.

The bridge will be a fixed-span, high-level structure similar in design to the Dalgren Bridge across the Potomac River in Virginia. It will have a 22-ft roadway. A toll span, the bridge will be financed from a $95 million bond issue, of which $58 million will go to the Hampton Roads tunnel. (p 62)

Personnel

E. L. Rose is superintendent for Diamond Construction Co., and R. Holley is resident engineer for the consulting engineers, Modjeski & Masters. The project is sponsored by the Virginia Dept. of Highways.

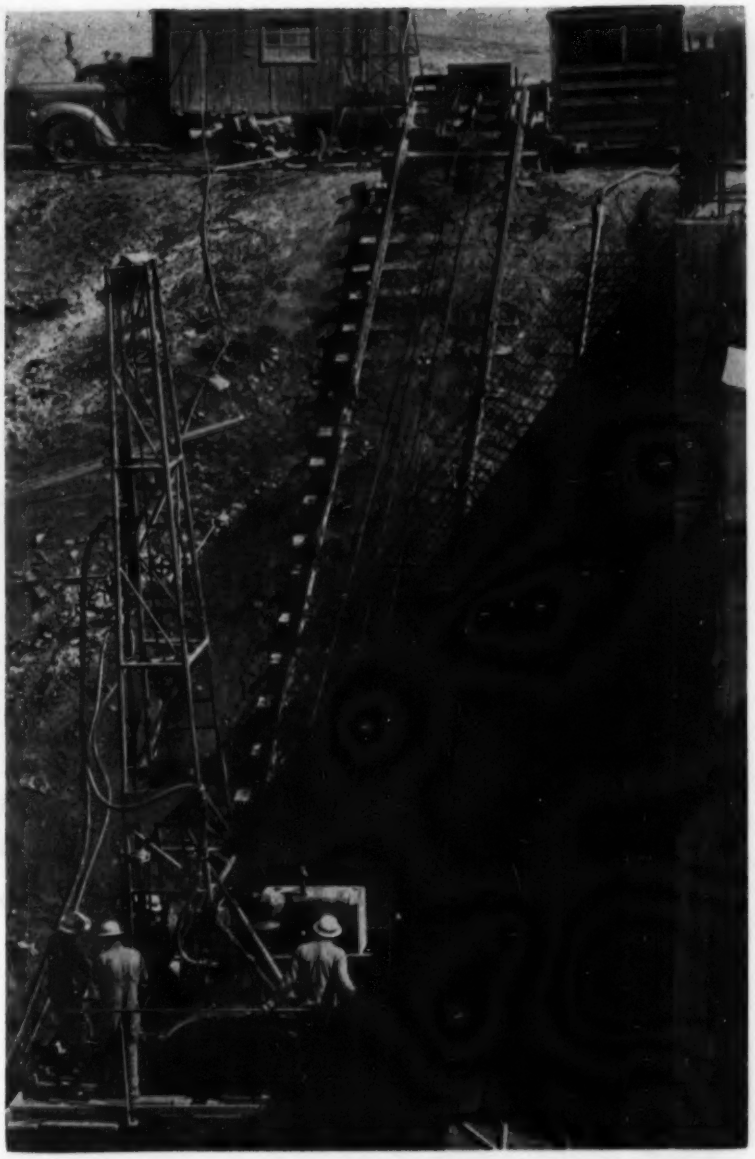
FOURTH PIPE TOWER stands loose until caisson is moved to three pinned towers.

Rail-Mounted Drill Climbs Slopes Easily

ARMY ENGINEERS supervising construction of Garrison Dam on the Missouri River in North Dakota turned a dangerous and time-consuming job into a safe, efficient operation by designing and fabricating a rail-mounted drilling rig.

To control seepage through lignite seams at the east and west abutments of the dam, extensive grouting was necessary. Advance planning had not anticipated this. The lignite seams are in the bluffs of the river and do not extend across the floor of the valley.

A rotary drill would have to move frequently up and down 2:1 slopes to drill the grout holes. Moving the rig by ground-skidding obviously would be both slow and hazardous. So technicians in the exploration branch of the Garrison District office built a rail-mounted drill to do the job.



RIDING ON RAILS, drill rig can move up or down steep slopes at Garrison Dam in only about one-third the time that would be required to ground-skid a drill into place.

How It Works

The railroad track lies parallel to the line of grout holes. The rotary drill is mounted on a shop-made, steel table frame so that the drill rides level on the slope. The two forward legs of the frame are fitted with plain skidding shoes; the two rear legs have small rollers extending about ½ in. below the shoe face.

A two-drum winch powered by a Ford V-8 motor at the top of the slope is tied off to two dead men. The cable from one drum is connected to a running sheave fastened to the upper part of the skid frame by a two-legged sling. The other cable—used primarily as a safety line—is connected to the lower part of the frame. When positioned for drilling, the frame is securely chained at each corner to the rails.

The drill moves safely, easily and quickly up and down the slope by means of the cables. Moving time is estimated at about one-third the time the skidding process would have required.

The drill is a Longyear "UG" Straitline model. A Gardner-Denver 3x4-in. pump mounted on the drill-rig platform supplies water for drilling. At a recent count, 59 holes had been drilled and grouted for a total of 13,100 drill ft on the two slopes. The holes are 4-in. dia and vary from 150 to 265 ft deep. Average depth is about 222 ft.

Much of the early drilling and grouting was done during the winter in below zero weather. Heated water from the Riverdale, N.D., power plant was brought to the site in two truck-mounted 1,000-gal tanks. Grout mixing was done inside a van-type truck heated by an oil-burning stove. Grouting equipment consisted of a 5¼x3x5-in. Gardner-Denver grout pump and two metal tubs, each of 12-cu ft capacity. Each tub is equipped with paddles turned by separate air motors.

Garrison Dam is a key structure in the Missouri River Basin Development Program. Construction began in 1947, and the dam now is about 84% completed. It will impound about 23,000,000 acre-ft of water. The first of three 80,000-kw generators is scheduled to go on the line within the next few months.

Specially designed to work on a storm drain excavation job...

Self-Propelled Shield Braces Deep Trench

KEY FEATURE of mammoth trench shield displayed here in manufacturer's yard is hydraulic jack-propulsion system powered by a gas engine-driven Rogers D-2 hydraulic pump.

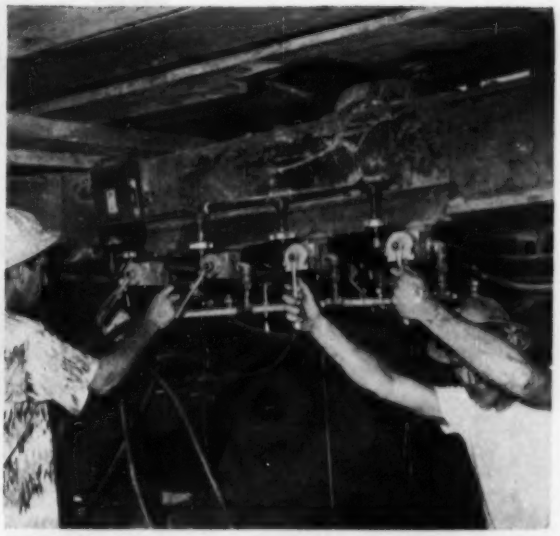
A SELF-PROPELLED TRENCH SHIELD capable of supporting trench walls 15 ft deep until sheeting, wales and struts can be installed is at work in Long Beach, Calif.

Trench shields are not new, but self-propelled units are rare. And this one has a system of trailing wales that the machine's builders believe has not been used previously in construction operations.

The rig is in operation on the Seaside storm drain, a project of the Los Angeles County Flood Control District. A joint venture of Stolte, Inc., and Morrison-Knudsen Co., Inc., holds a $1.2 million contract for the job. Maurice R. McClure, manager of Stolte's utility department, designed the rig, and it was built in Stolte's Oakland, Calif., shop.

Key feature of the machine is

FOUR 50-TON JACKS inch shield forward by thrust against trench sheeting. Jacks have 30-in. stroke. Full power can be exerted on one jack or any combination of jacks on either side of shield.



PERISCOPE with cross hairs helps shield-operator keep rig on true course. Assistant operates valves from hydraulic pump, which control jack pressure. Pump is capable of 10,000 psi.

the hydraulic jack propulsion system. Four 50-ton jacks are powered by a gasoline engine-driven Rogers D-2 hydraulic pump mounted on the moving shield. The pump is capable of 10,000 psi.

A Northwest 80D backhoe, operating separately from the shield, excavates the trench ahead. As the trench is dug, the hydraulic jacks push against 3x12-in. sheeting already installed to inch the shield ahead. Two transverse rams at the rear press against the sheeting to steady it during the move.

After at least 12 in. of travel, the jacks are retracted, and a new pair of sheeting members are installed. The jacks have 30 in. stroke so the shield can move ahead the width of two 3x12-in. sheets if the ground is good enough.

The jacks are so arranged that they can be either individually controlled or gang-operated—full power can be exerted on any one jack or any combination of jacks in either direction.

A plow-action device mounted on the rig's lower edge digs a trench 3 in. wide and 8 in. deep to provide a toe hold for the lower 8 in. of the wood sheets.

The trailing wales attached to the rear of the machine are simply four 14-ft long H-beams. They are supported temporarily until some sheeting is installed and screw-type struts can be braced between the trailing wales.

This permits installation of the more permanent timber wales and struts after the main body of the shield has passed. Permanent wales are 8x12 timbers. Two sets are used in good ground; three sets are needed in poorer ground and in deeper excavation.

CROSS-RAMS push against shoring to hold it steady as jacks move the shield forward. Plow-action device on lower edge digs trench to provide toe-hold for wood sheets.

The shield can be adjusted from a minimum width of 8 ft 2 in. to a maximum width of 11 ft 8 in. by means of telescopic box sections. This range of widths will provide a trench for laying pipe from 60 to 96 in. dia.

The main body of the shield is 10 ft high and 12 ft long at the longest point. It has adjustable, self-supporting side-boards that provide an additional 3 ft of height. Even so, the rig will operate considerably below ground level at times. Maximum depth on the job will be about 22 ft.

A pair of adjustable shoes at the lower leading edge of the shield prevents rotation and permits the operator to maintain proper ditch grade. These shoes carry the vertical load of the rig and its mechanical equipment.

The job is programmed for about 30 ft of excavation a day. Excavated material is sandy and requires careful and positive support. Pipe laying operations follow the machine by from 30 to 100 ft. The job superintendent is Albert E. Williams.

New Tricks Simplify Slab Prestressing

1 MOVABLE PLATFORM mounts double line of spindles which carry 47 reels of high-strength strand. Reels unwind between line of spindles to feed strands into tube guides. Reels are specially wrapped to unwind from top.

CONTRACTOR'S CONTINUE to turn up new tricks for improving mass-production of pre-tensioned concrete units. They have developed ways to unreel wire faster, place forms more easily and simplify jacking.

One of the smoothest prestressing jobs now under way is at the New York Port Authority's new Pier "A" in Hoboken, N. J. J. Rich Steers Corp. of New York is precasting and pre-tensioning about 2,000 deck slabs. With a six-bed casting yard, it turns out 24 units a day.

The 5-ft wide precast slabs are 19½ ft long and 1 ft thick. They are prestressed with 48 strands of ⅜-in. Roebling high-strength wire placed in three levels. Each strand is stressed to 173,000 psi.

The yard is set up so that reels, jacks and other equipment can be moved easily to any bed. The procedure is simple. Strands are locked in a templet, which is pulled down the bed. When the templet is anchored at the far end, the strands at the jacking end are cut, locked in a similar templet and tensioned

4 STEEL CART mounts Chicago-Pneumatic air hoist which pulls dolly down casting bed. Wheel mounting makes it easy to move platform to any bed. Every day, two beds of 12 slabs each are poured, as a second set of slabs is stressed and a third set is stripped.

5 AIR-HOIST OPERATOR watches signals of men on spindle platform as he pulls dolly near anchoring abutment.

6 STEEL TEMPLET attached temporarily to dolly is pulled beyond anchoring abutment. Templet is then removed.

2 HIGH-STRENGTH STRAND of ⅜-in. Roebling wire is fed through hole in steel templet and anchored with double-cone-type gripper. Slabs have 47 strands, each containing 7 wires.

by two 100-ton jacks. Concrete then is poured over the strands. When the concrete attains a strength of 4,200 psi, the strands are cut, and the slabs are stockpiled. Fork-lift trucks haul slabs to barges for towing to the pier site.

R. Tower is project superintendent and T. Hodgetts is casting-yard superintendent for J. Rich Steers Corp. For the New York Port Authority, E. Barron is resident engineer, H. Frank is assistant resident engineer, and J. Kelly is casting yard inspector.

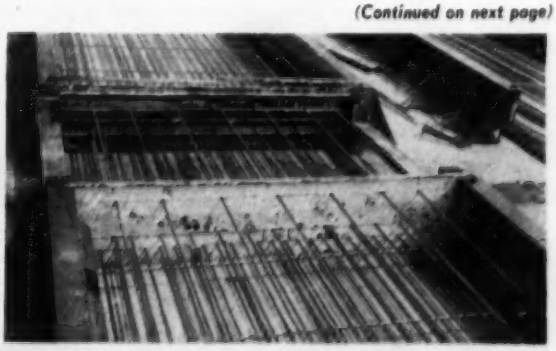
3 STEEL DOLLY carrying templet is pulled down casting bed as wires unreel on spindles. Dolly's triangular shape and 4-wheel mounting make it easy to control when pulled down bed.

7 HEAVY STEEL BEAM is rolled between templet and anchoring abutment. Beam supports templet when strands are tensioned.

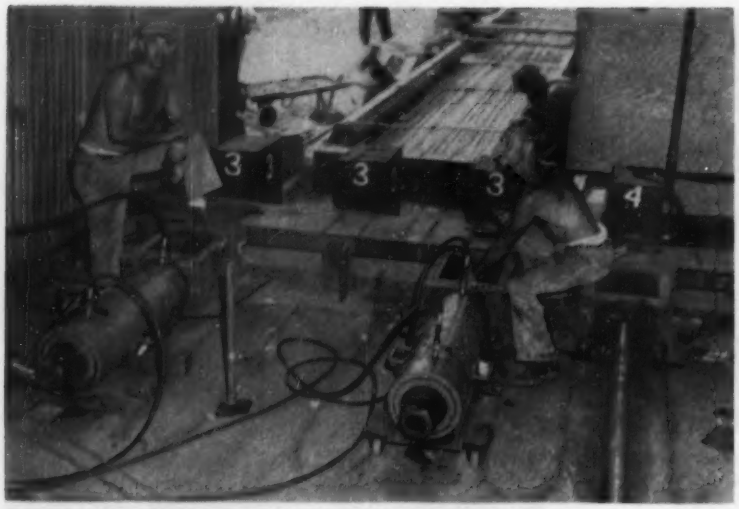
9 STRANDS extending beyond templet at jacking end of bed are cut easily by Skilsaw with carborundum blade.

(Continued on next page)

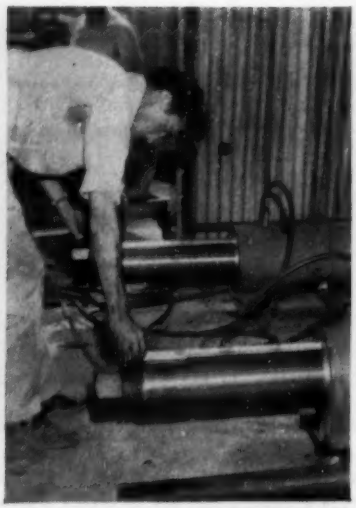
8 STEEL SIDE FORMS are quickly slid into place and bolted to bed. Slotted flange which receives bolt permits forms to slide.



10 STEEL BULKHEADS at ends of slab forms keep strands in proper position during pouring. Steel bars connect form tops.



11 TWO 100-TON JACKS powered by Rodgers hydraulic pump are connected to jacking beam. As rams extend, workmen turn up nuts inside block in front of jacks. When jacking is completed, nuts take up tension and jacks are removed.



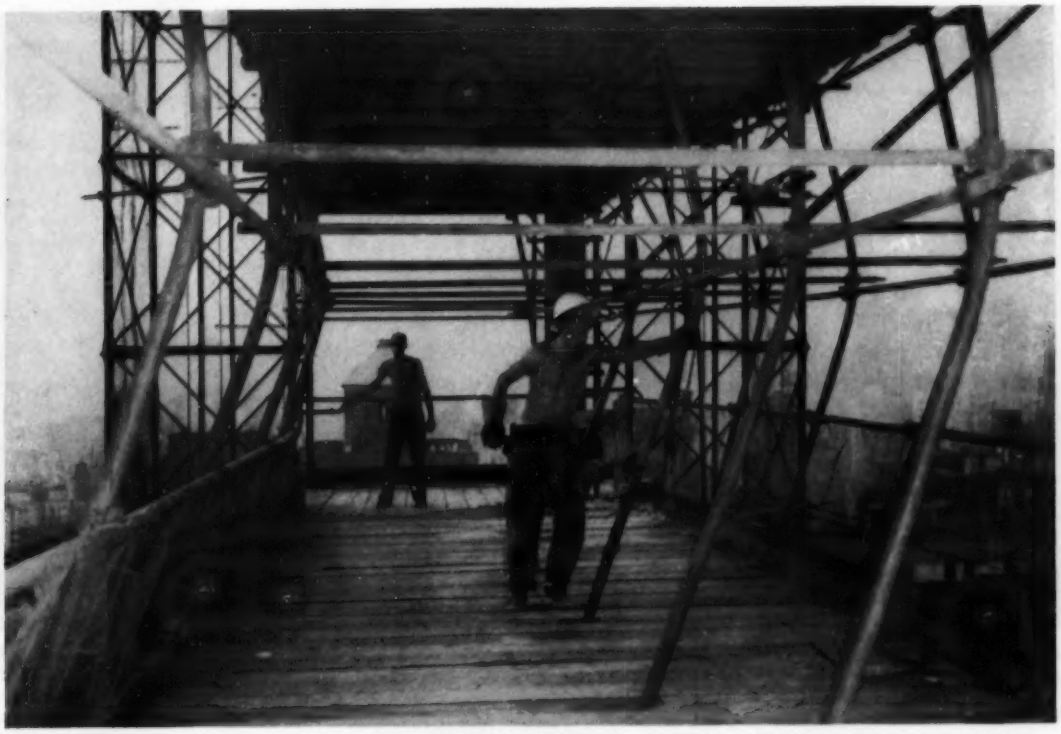
12 JACK RAMS are measured to check elongation of strands. Stress of 173,000 psi requires elongation of nearly 20½ in.

13 REINFORCING BARS are tied across tensioned strands near anchoring abutment. Note double-cone-type grippers.

14 READY-MIX CONCRETE is chuted into forms and vibrated. Concrete for inside line of slabs is placed by conveyor.

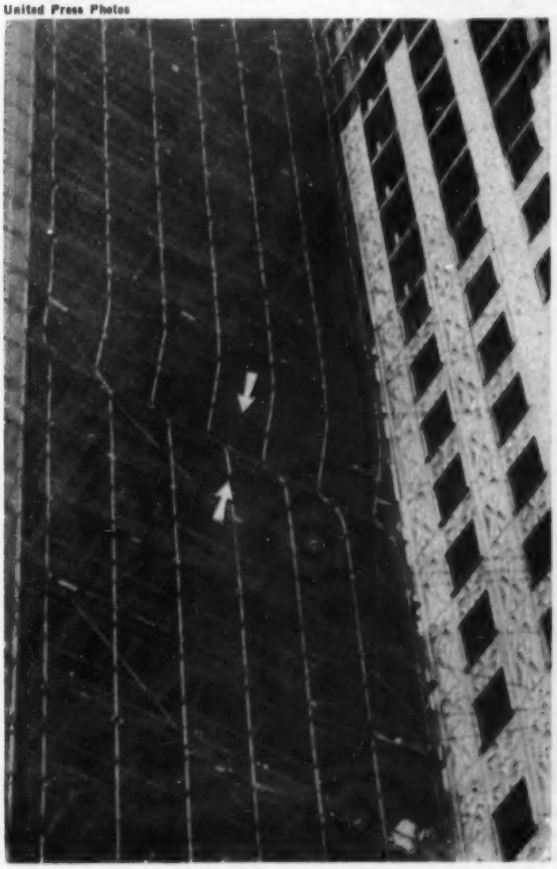
15 CAST SLABS are water-cured for 8 hr, steam-cured for 16 hr. When concrete strength reaches 4,200 lb, strands are cut.

16 PRESTRESSED SLAB is lifted from stockpile by Clark fork-lift truck and hauled to barge for towing to pier. The 5-ft wide slabs are 19½ ft long, 1 ft thick, and weigh 7 tons. At pier, they span pile caps.



WAS IT THE HEAT that caused scaffolding to buckle at the 18-story level of the Socony-Mobil Building during one of the worst heat waves on record? That is one theory advanced, but the cause of the failure has not yet been established.

United Press Photos



Scaffolding Bows Out Over Busy N. Y. Street

BUCKLING PIPE COLUMNS nearly halfway up to hoist towers for the 45-story Socony-Mobil Building in New York City threw a scare into city officials and construction men on the job. But the columns did not break, and repairs were completed in three days.

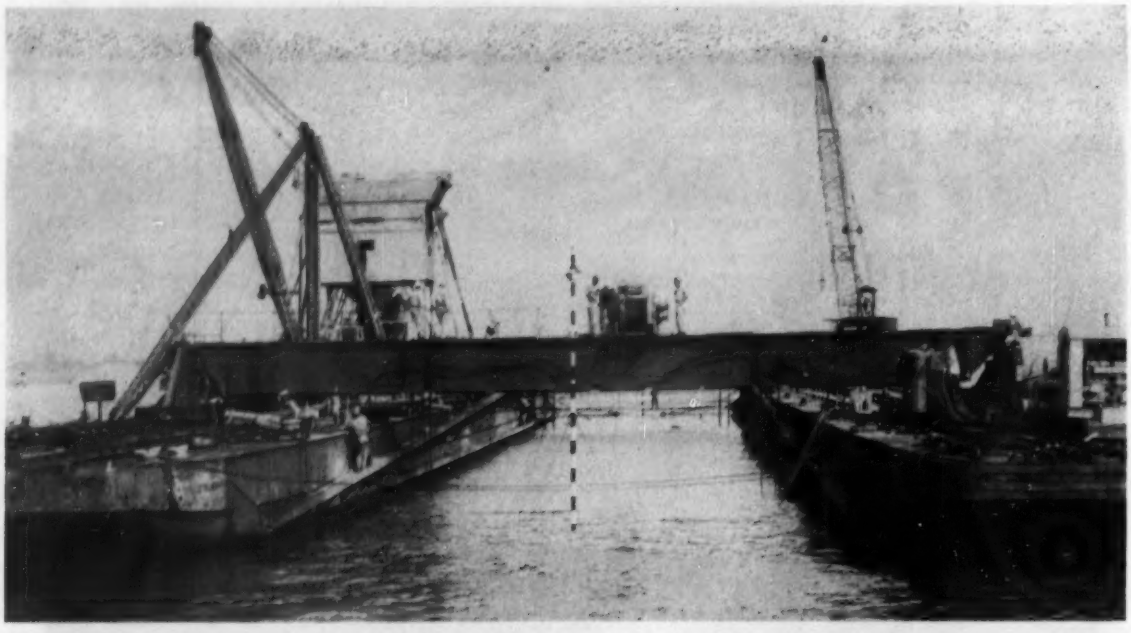
The columns bowed out several feet without warning at the 18-story level. Until the extent of the damage was known, police evacuated occupants of all buildings in the adjacent city block and closed surrounding streets to traffic.

First step in the repair operation was to pick up the weight of the structure above the bends with steel cables hung from the building. Then, two new 2½-in. pipe columns were installed on each side of the bent pipe, and more diagonal bracing was put in.

The city building department and the Chesebro-Whitman Co., which leases the structure to Turner Construction Co., the general contractor, are investigating to determine what caused the failure.

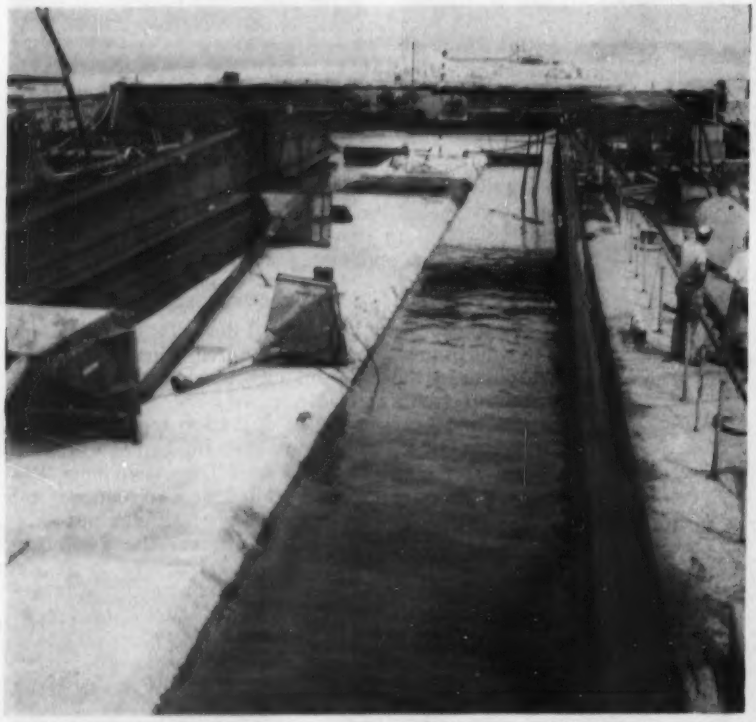
←

NO SERIOUS DAMAGE resulted from the failure. The curb-side hoist tower was joined to the building at each floor level and tied back with steel cables at frequent intervals.



SUBMERGED TUBE mounting range poles at each end sinks out of sight between car floats. Filled with 200 tons of extra concrete for negative buoyancy, tube is lowered into trench by four 12-part lines reeved through cross-beams and operated by hoists.

Linked Car Floats Quickly Sink Tunnel Tubes

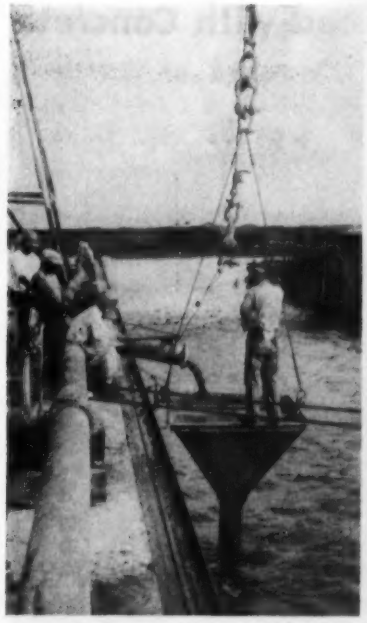


CONCRETE CAP on floating tube projects only 1 ft above water. When tube is connected to cross-beams, it will be sunk as shown in top photo. Before tubes are brought in, rail-mounted carriage drags screed over trench bottom to smooth gravel blanket.

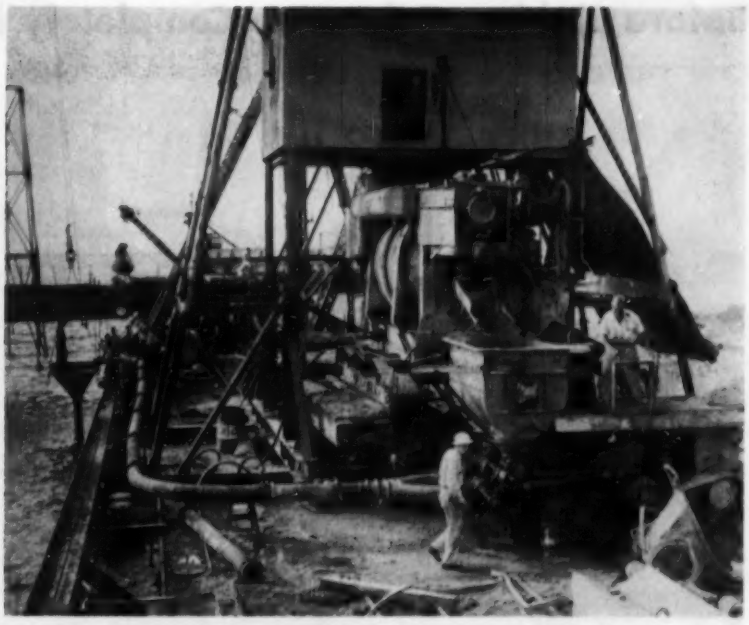
TWO CAR FLOATS linked 50 ft apart by heavy girders are simplifying tube sinking on Virginia's Hampton Roads tunnel. They screed the gravel blanket in the tube-cradling trench, mount a concrete plant, position the tubes and control their sinking.

Devised by the contractor, Merritt-Chapman & Scott Corp. of New York, the car-float system is a big improvement over former methods. Previously, the screed barge and concrete plant required separate units. Another disadvantage was lowering tubes with floating cranes. Because of the cranes' limited hoisting capacity, the contractor could not add enough extra concrete to the tube to provide the required negative buoyancy. In fact concrete blocks were sometimes set on top of the lowered tube as temporary ballast until it was completely filled with concrete.

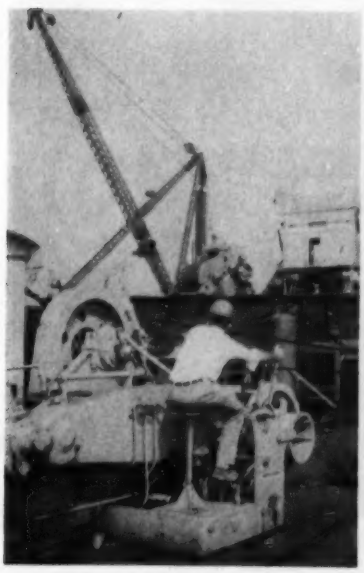
But the car-float arrangement greatly simplifies this operation. The tube is floated between the two well-anchored floats and connected to the overhead girders by a 4-point pickup. Each pickup is a 12-part line operated by a hoist and capable of holding a 50-ton load.



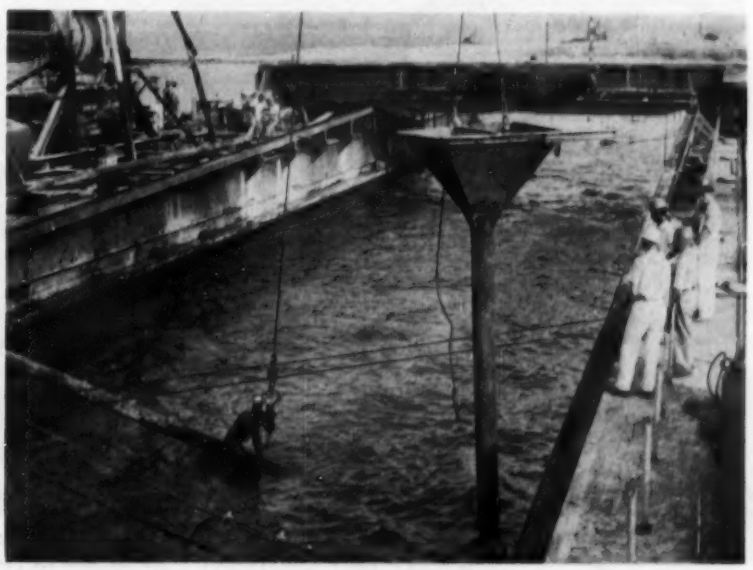
PUMPCRETE LINE dumps into tremie pipe to fill pockets of submerged tube. Weight provides negative buoyancy to hold tube after it is sunk.



DUAL-DRUM PAVER set up under batch bins dumps concrete into hopper of 8-in. Pumpcrete machine. Short pipeline carries mix to tremie pipe. Note positioning tower, on left, mounted on submerged tube. Fast-moving tube-sinking rig is on heels of clamshell dredge.



THREE-DRUM SKAGIT HOIST operates pair of 12-part lines that lower tube. Two big hoists easily handle 200-ton load.



TREMIE PIPE is lowered into side pocket as tube hangs only a few inches below water. Workman standing on cap of tube, barely visible, ties line to Pumpcrete pipe which will be lifted over funnel. Pockets are filled from alternate sides to equalize loading.

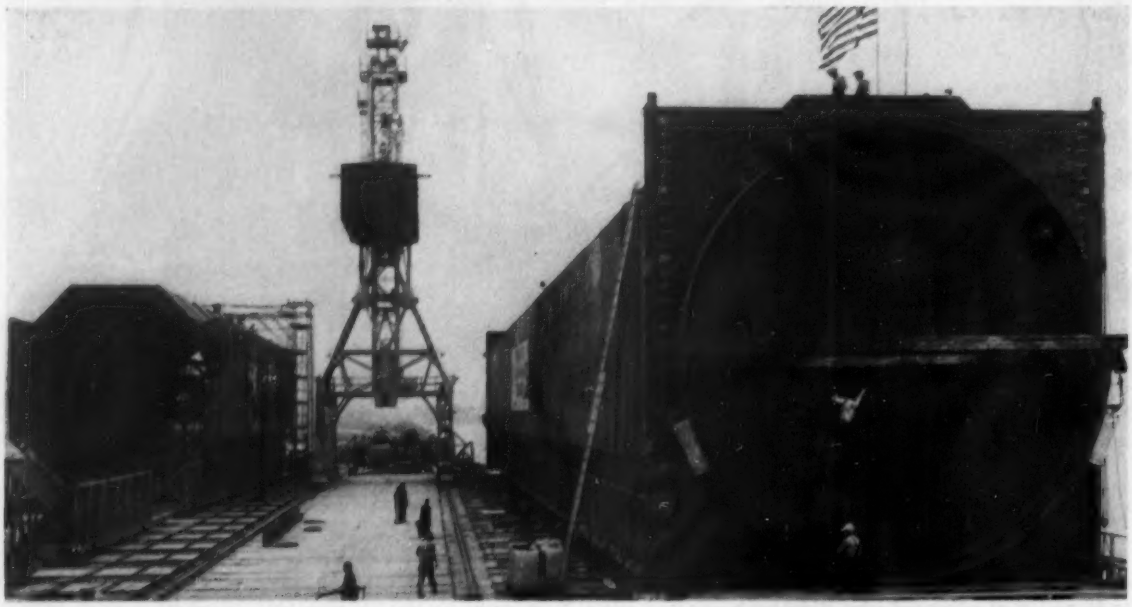
This allows the contractor to add 200 tons of extra weight before sinking—more than enough to hold the tube in place after it is lowered into the trench.

The extra weight is added by pumping tremie concrete into circumferential pockets around the inside shell of the tube. Concrete is batched and mixed on one of the two floats, dumped into an 8-in. Pumpcrete, pumped to a tremie pipe and fed into the pockets.

When negative buoyancy reaches 200 tons, hoists operating the 4-point pickup lower the tube away. As it goes down, engineers keep their transits aimed at positioning towers to guide the descent. After the tube comes to rest, the remainder of the pockets are filled with concrete, providing a ballast of 450 tons. The tube then is connected underwater to its neighbor.

But before the tubes can be sunk, months of preparatory work are done on them. Each of the 23 tubes

Before Sinking, Tubes Are Completely Lined with Concrete



FABRICATION OF ONE TUBE nears completion as another is started. As soon as concrete is placed in the keel, the big units are bulkheaded, launched like ships and towed to a shape-up pier in Norfolk. Tubes are fabricated near Philadelphia.

SHAPE-UP PIER at Norfolk can process four tubes at once. Here, Tube No. 4 slowly sinks as concrete lining is added. Half-cylindrical sections shown on pier will be driven on each side of bulkhead to provide form for joint pour when tube is sunk.

first is fabricated at the Eddystone, Pa. works of the Baldwin-Lima-Hamilton Corp. They are 300 ft long and consist of a 30-ft dia steel-plate cylinder inside a steel-plate octagonal shell 37 ft wide. The two shells are separated and supported by diaphragms spaced 15 ft apart.

After concrete is placed between the two shells to serve as a keel, each tube is bulkheaded at the ends and launched like a ship. Then it is towed to a shape-up pier near the tunnel site. Here, at least four of the big units can be berthed at one time while their inner shells are lined with concrete. After six weeks, the lining is completed and they are towed to the car-float assembly and sunk.

Lining is no simple process. Four tubes must be in process at all times in the shape-up area to maintain the rigid schedule. Project manager Robert I. Senn has planned the job to turn out one tube every two weeks.

To turn the steel shell into a two-lane tunnel the interior is poured in six consecutive stages. The first is the invert, followed by haunches, roadway, slab, walls, curbs and sidewalk and finally arch.

The invert pour is made from one end of the tube to the other. Simple wood side forms supported by brackets act as guides for a

(Continued on page 68)

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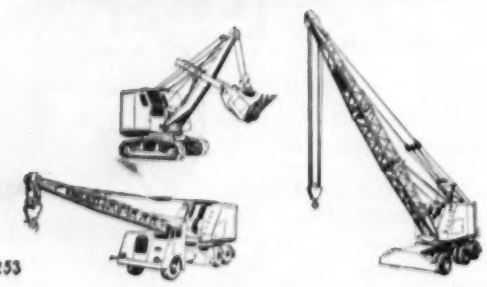

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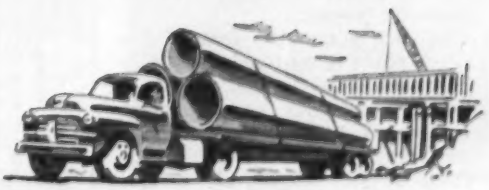

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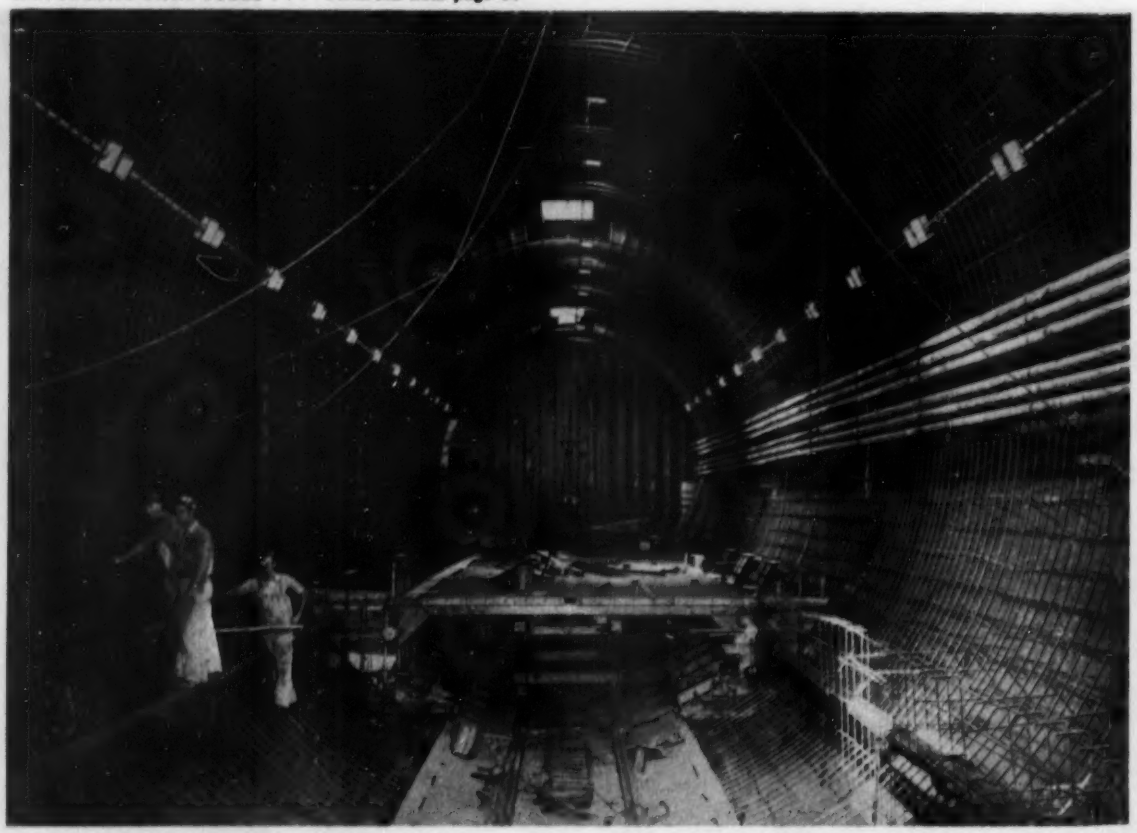


INSIDE TUBE, rail-mounted traveler running over poured invert places 37½-ft section of forms for haunch pour. The same section of form and traveler also will handle roadway slab. Tubes are towed out and sunk six weeks after they arrive at shape-up pier.

rocker-type screeding mechanism.

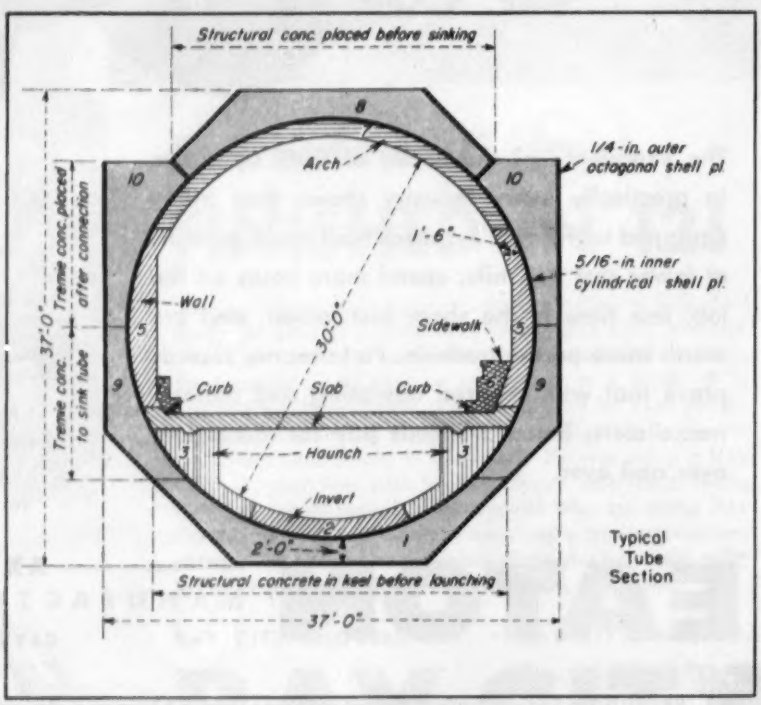
Above the invert, all stages are poured in two 150-ft steps. This means that each set of forms is used twice in a tube. Pouring is scheduled so that only two 150-ft sets of Blaw-Knox steel forms are needed to serve four tubes in the shape-up process.

In each stage, the first of the 150-ft pours is centered about two 75-ft sections at the quarter points. As soon as the form can be stripped, half of each 75-ft section is moved one way and half the other way. These 37½-ft lengths are carried intact by travelers to complete the stage.

Two pairs of travelers are required. One rides on rails placed over the invert to handle haunch and slab forms. The second traveler rides rails on the slab and handles wall and arch forms. The two big travelers are raised and lowered by a hydraulic jack in each of the four legs.

Although forms are moved by traveler in units up to 37½ ft long, they consist of small steel segments. In fact, both form and trav-

(Continued on page 72)



CROSS-SECTION SKETCH shows complete pouring sequence. Inner lining is done at shape-up pier. Tremie concrete is placed by inserting pipe through opening above pockets.

(Advertisement)

Note the stringers of Stoody 21 which act as "buffers" between abrasive earth and bucket sides. Inside surfaces of bucket receive similar protection.

All Buckets Take a Beating... Here's the Medicine!

We're often asked about bucket maintenance, what hard-facing material to use and how to use it for maximum wear protection. Actually, your own equipment gives you part of the answer. Each bucket wears differently, depending upon how it is used and the kind of material handled. By watching for development of wear patterns, then hard-facing these areas at definite intervals, you'll get extended service with greatest economy. *Remember, a frequent touch-up is better than a major repair*...more economical in hard-metal and less costly in down time.

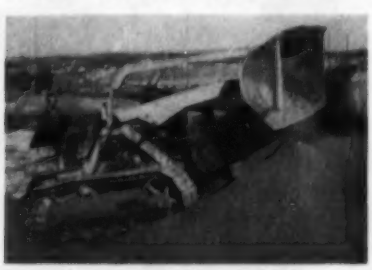
If buckets are severely worn, first build up with Stoody Manganese. For hard-facing, the alloy most commonly used is Stoody 21, preferred because of good wear resistance, fast deposition rate and low price. Occasionally, under conditions of excessive abrasion, Coated Tube Stoodite gives longer life on shovel teeth and reduces maintenance costs.

Full particulars on alloy recommendations and hard-facing procedures are in the Stoody HARD-FACING GUIDEBOOK. Ask your dealer for a copy (check the "yellow pages" of your phone book) or write direct.

Bucket teeth (top illustration) and adapters (above) are amply coated with Stoody 21. Hard-faced teeth on this job averaged two full shifts of extra service before needing additional hard-facing treatment.

These Stoody 21 beads across the bucket resist severe abrasion as it is dragged across rubble, returning for a new bite.

Lips on this clam shell are kept in good shape for a tight seal with Stoody 21.



Scoop lifts often lead a tough life. Here, lips, sides and bottoms are kept in good condition with Stoody 21. Occasional touch-ups are made as wear occurs.

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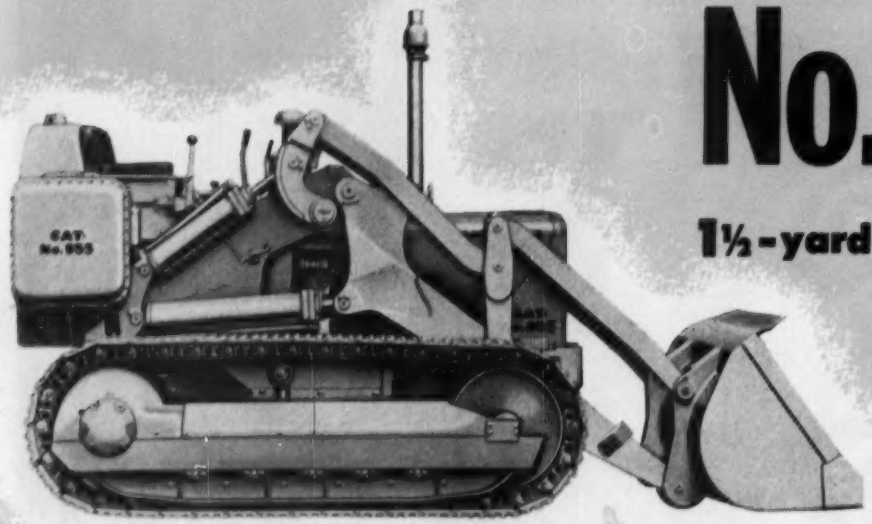

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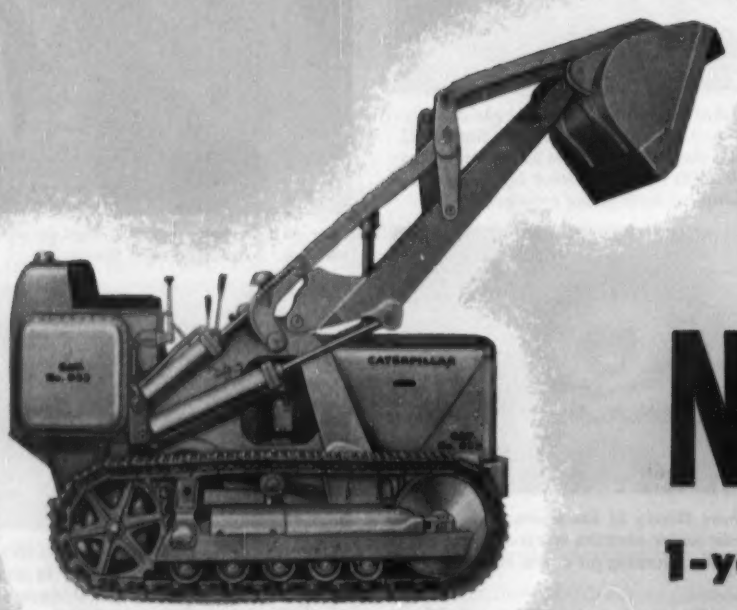
Caterpillar announces

2 NEW



No. 933

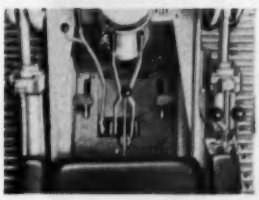
1-yard capacity

"BIG-PRODUCTION" FEATURES OF THE NEW NO. 955 AND NO. 933

40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL. Large tip-back at low bucket height results in larger loads every pass—bigger production per day!

NEW OIL-TYPE CLUTCH. Stands up under continuous, repeated use. Cuts maintenance costs and time two ways: (1) Clutch adjustment, while easy, is seldom required. (2) Plate replacement is often unnecessary even at engine overhaul.

Also helps step up production with easier shifting for operator.



CONVENIENTLY LOCATED LIFT AND DUMP LEVERS. All controls are within easy reach—bucket controls are a one-hand operation!

"DESIGNED-IN" COMFORT. Operator sits high in a comfortable seat, with excellent visibility of all bucket conditions.

PERFECT BALANCE. Weight distribution, engine horsepower and bucket capacity are balanced so that the full length of the track stays on the ground with a heaped load in the bucket.

NEW 3-GROUSER TRACK SHOES. Tested and proved on tough jobs, they deliver better traction—longer life.

OPTIONAL STARTING. Your choice of 6-volt electric starting for starting engine or 24-volt direct electric starting—from the seat, either way.

VERSATILE ATTACHMENTS. Your job range is increased by a variety of buckets and other useful attachments.

BRIEF SPECIFICATIONS	No. 955	No. 933
Flywheel HP at sea level	70	50
Bucket capacity, cu. yd.	1½	1
Bucket tip-back at ground level, degrees	40	40
Bucket tip-back at max. lift, degrees	47½	48
Dumping height (center of hinge pin to ground)	128"	118½"
Weight (approx.) lb.	21,480	15,500

TRAXCAVATORS

MODERN HYDRAULIC SYSTEM. Full-flow hydraulic system filter protects moving parts against abrasive particles in fluid. Filter handily located for easy replacement of element.

Hydraulically balanced vane-type pump insures delivery of full volume and pressure of oil for thousands of hours. Operating valves in tank provide maximum protection against damage and dirt. Closed hydraulic system—no vents or breathers—prevents entrance of dirt.

HIGH REACH. Plus strong box section arms for rugged service. Box-type cross brace prevents twisting or bending.

PLENTY OF POWER. Power is ample to "bury" the bucket and provide fast lifting action and positive dumping under all load conditions.

BALANCED UNITS for BIGGER PROFIT!

Designed from the ground up as excavating and loading machines, these two new CAT*-built Traxcavators* are balanced for bigger production at lower cost. Built and backed by *one* manufacturer, they give you all the advantages of single manufacturing responsibility. With practical, advance-design features, they're engineered to *outproduce* ordinary tractor-shovels of the same capacity. You'll find these units the handiest tools in your line-up. Get the money-making picture from your Caterpillar Dealer—ask for a demonstration!

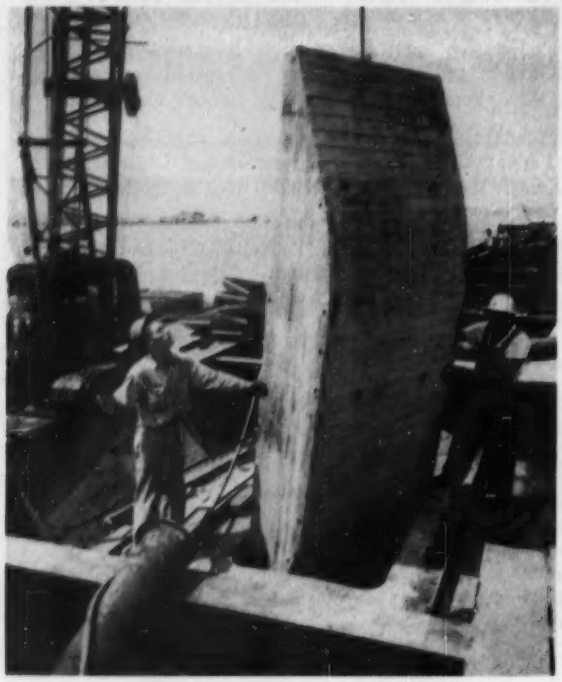
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

NEW BIG-PRODUCTION TRAXCAVATORS

ANOTHER EXAMPLE OF CATERPILLAR LEADERSHIP IN ACTION



SMALL HATCHES limit size of Blaw-Knox steel panels. Even travelers must be disassembled before going in and coming out. Top is later capped with concrete.

WALL PANEL just fits through 6x4-ft hatch as it is lowered into tube. Wires welded to form skin score concrete wall to provide strong bond with tile overlay.

eler pieces have to be small enough to pass through 6x4-ft hatches in the roof of the tube.

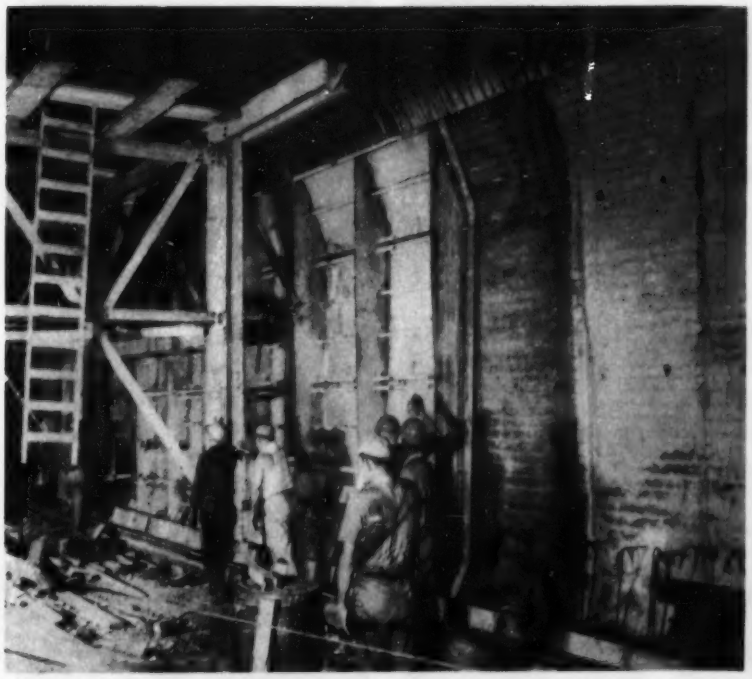
When wall forms are first brought into the tube they are handled by Chicago-Pneumatic air hoists mounted at each end on the bulkhead. After the first pour, they are moved by traveler. Arch forms, however, are lowered through a hatch on to the traveler, carried to the forming area and erected. They are supported by steel wall plates on jack-post frames that rest on the roadway slab.

AIR HOIST mounted on heavily reinforced bulkhead pulls on line reeved through overhead blocks. At other end of line a steel wall panel is lifted into position. All heavy handling is done with two Chicago-Pneumatic hoists.

Both wall and arch forms are held in place by ¾-in. granular, flux-filled studs varying in length up to 27 in. They are end-welded to the circular plate with a Nelson welding gun. Stud-welded shebolts with 4-in. square bearing plates are then run down on the studs.

Concrete placing is handled entirely by Pumpcrete. Lines are carried from the plant to the top of each tube where they dump into hoppers placed in the hatches. Invert, haunches and slab are poured by elephant trunk. Concrete for walls is chuted to either side of the tube and dumped behind the forms. Internal vibrators consolidate the mix. Arch concrete is poured directly into the forms and vibrated vigorously to prevent honeycombing. After the interior concrete lining is completed, portions of the side pockets between the two shells are filled with tremie concrete to increase stability. Then the top is capped with more concrete, lowering the tube until it has only 1 ft of freeboard.

While the tubes are being lined, the trench across Hampton Roads is excavated by a clamshell dredge with an 8-yd bucket. The trench is excavated about 50 ft deep and 40 ft wide at its base, and it has sides that slope 1 on 2½. Stretching



RAIL-MOUNTED TRAVELER strips 37½-ft section of wall form and moves it to next pour. Forms are suspended from traveler by steamboat-ratchet-type brackets. Concrete is pumped into top of tube, dumped into hopper and chuted behind forms.

STUDS for holding wall and arch forms in place are end-welded to inner shell by Nelson gun. She-bolt is then run over stud.

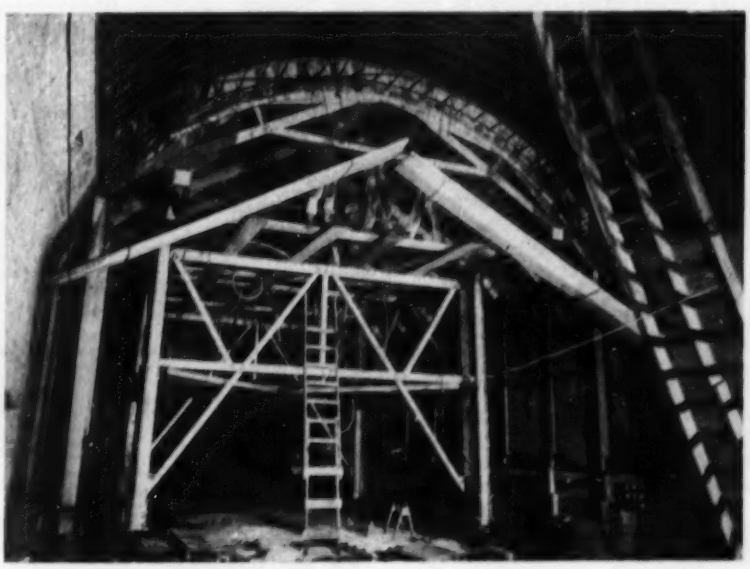
6,860 ft between two artificial sand islands, the tunnel grade slopes ½% at the middle and 4% on the ends.

Just before each tube is brought out to the car-float assembly, a 2-ft gravel blanket is placed in the excavated trench. The material is cast by clamshell and then screeded underwater by an ingenious device. Riding on rails attached to the inside of the two floats, a self-propelled carriage pulls a 20-ft steel screed over the trench. There are two sets of rails, one at 4% slope and one at ½%, matching the grade of the trench. Because of the slope, the depth of the screed need only be adjusted once for each section. The carriage's hoist has four drums for pulling itself up and down the rails and two drums for hoisting the screed.

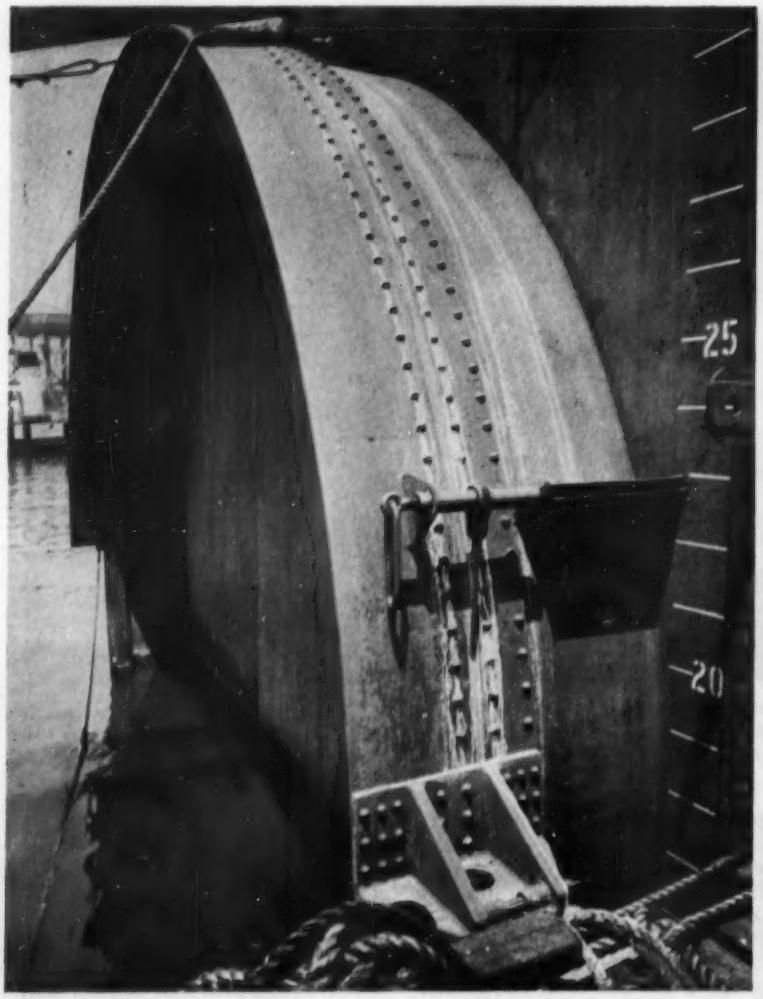
When a tube finally is lowered into the trench, it is pulled against its neighbor. Tubes are fabricated with semi-cylindrical hood-plates extending 18 in. beyond each end. The top hood-plate of one tube is matched to the bottom hood-plate on its neighbor, forming a ring.

To pull the outer tube in as tight as possible, divers hook previously placed steamboat ratchets on one tube into matching lugs on the other. When the tubes are tight, divers place 5-in. dia pins into pairs of lugs at the abutting edges of the hood-plates. Sand is then chuted by pipe until the tube is firmly embedded up to the first knuckle of the outer octagonal shell. More sand then is placed over the middle of the tube section, keeping the end clear for connection to the next section.

The remainder of the jointing operation is completed after several more tubes are sunk. Semicircular closure plates with sheet-pile anchors are fitted into similar anchors fabricated on the tube. One closure plate is driven on each side,



ARCH FORM supported by jack posts is vibrated vigorously during pour by workmen standing on traveler platform. When concrete sets, complete form-section will be moved ahead by traveler. Vertical adjustment of traveler is made with hydraulic jack in each leg.



HOOD PLATE at end of tube will mesh with opposite plate of neighboring tube when joined. Steamboat ratchets will be hooked over matching lugs. When ratchets are tightened, divers insert pins into pairs of lugs on hood plates.

DIVER descends into water to make adjustments at joint. Contractor depends on divers for many important operations.

STEEL SCREED that smooths gravel blanket in trench is pulled by carriage that rides between car floats on rails.

making a form with the bulkhead. Water and sand are then jetted out and tremie concrete is placed inside, sealing the joint. When all the tubes are sunk and connected, the bulkheads in each tube will be burned out, leaving 14½-ft sections of tunnel to pour.

After the full length of the tunnel is placed, more fill material is dumped on top to provide a minimum coverage of 5 ft. To make the connections with the sand islands at each end, earth dikes will be built up over the end tubes. They will then be dewatered, permitting dry construction of the portal.

The tunnel, sand island and approach bridges, being built by Merritt-Chapman & Scott on a $19,050,461 low-bid contract, are major features of a 23-mi tidewater area project described by the Virginia State Highway Department as the largest in its history. The 6,860-ft tube is the longest trench-type tunnel ever built.

R. I. Senn is project manager for Merritt-Chapman & Scott, working under Charles A. Richardson, vice-president of the company's Marine & Heavy Construction Department, and William Denny, executive vice-president and general manager of the Construction Division. Parsons, Brinckerhoff, Hall and MacDonald designed the tunnel-bridge crossing and are serving as consulting engineers with R. B. Stevenson as resident engineer.

New York City Permits First Bolted Building

HIGH STRENGTH BOLTING was approved for the first time in New York City, and it shaved weeks off the erection time of an 18-story apartment. The first few floors were already riveted when the variance in the building code was announced. Grand Iron Works, Inc. quickly switched erection crews to bolts. Amendments to the city's building code to permit more widespread application are now pending. The builder is Anthony Campagna & Sons. Bolts were supplied by Russell, Birdsall & Ward Bolt and Nut Co.

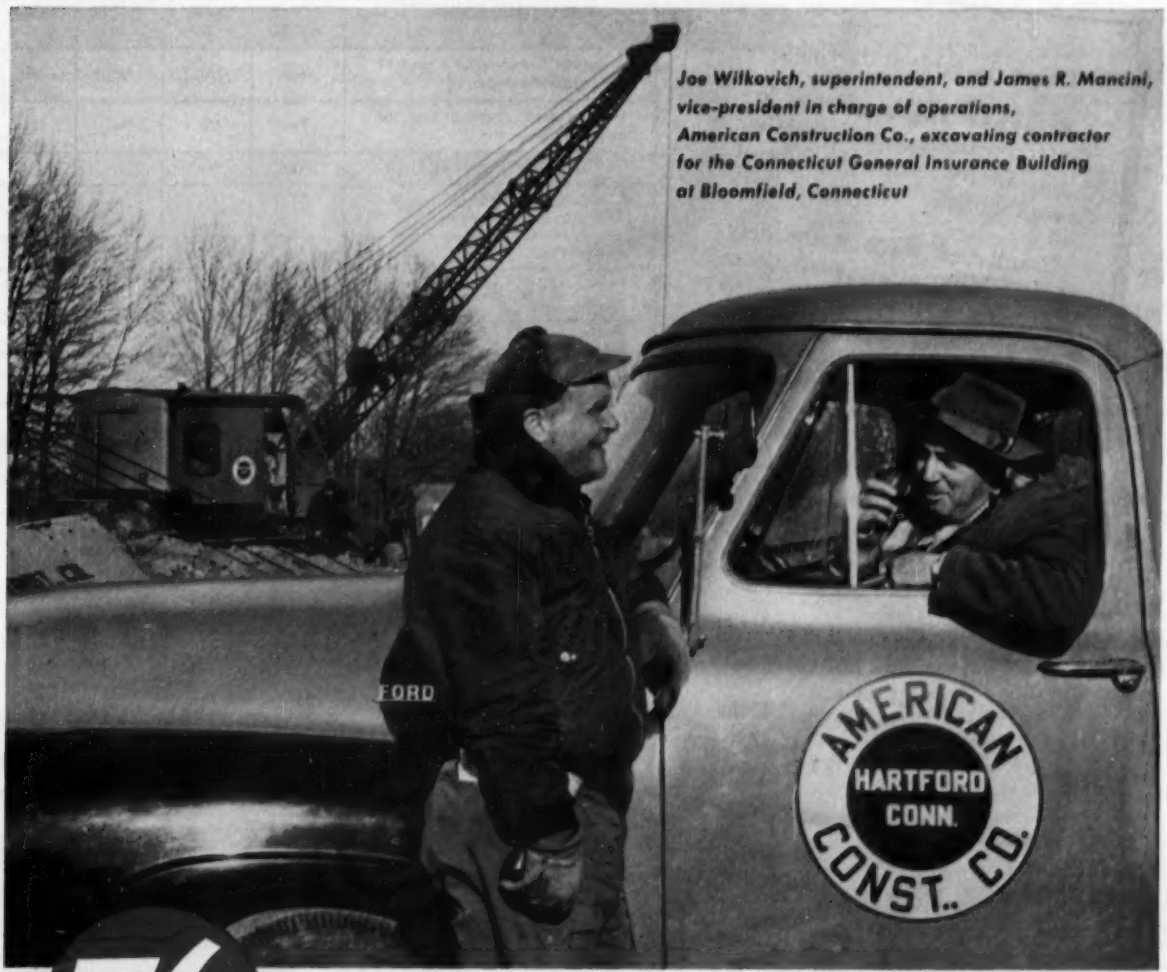
"...it pays to buy the finest"

"About five years ago a Union Oil Company representative recommended T5X motor oil and UNOBA *multi-purpose* grease for our equipment, and we agreed to try them on certain of our machines.

"After thorough testing of these products in a few pieces of our equipment we were more than gratified with the results. Engine performance improved and oil drain intervals were extended by using T5X. Costly lubrication errors became a thing of the past with *multi-purpose* UNOBA. In fact we've never had a part failure where this lubricant was used.

"We've standardized on Union lubricants for our more than 50 pieces of equipment. We endorse them without reservation to operators of gasoline or diesel-powered heavy-duty equipment that is subject to hard usage. We've found it pays to buy *the finest*."

From everywhere come reports like this one of the American Construction Co., Inc., of Hartford, Conn. There's a Union Oil representative near you. Call him and have him show you how Union Oil Company products can save you time and money... no matter what lubricants you're using now.



Joe Wilkovich, superintendent, and James R. Mancini, vice-president in charge of operations, American Construction Co., excavating contractor for the Connecticut General Insurance Building at Bloomfield, Connecticut

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UNION OIL COMPANY
OF CALIFORNIA

Los Angeles: Union Oil Bldg. • New York: 45 Rockefeller Plaza • Chicago: 1612 Bankers Bldg. • New Orleans: 644 National Bank of Commerce Bldg. • Atlanta: 401 Atlanta National Bldg. • Kansas City, Mo.: 612 W. 47th St.

WHY WACO IS YOUR SOUNDEST INVESTMENT IN SCAFFOLDING

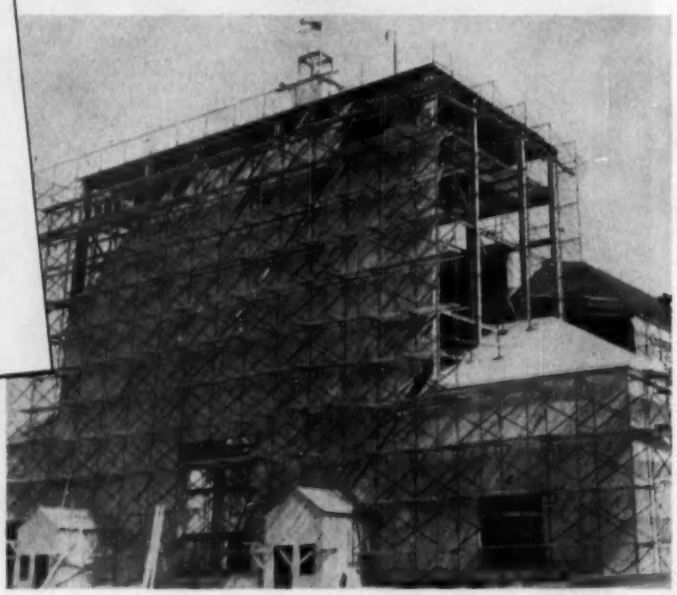
Check the table at the right . . .

COMPARE THE FEATURES OF WACO with those of three other nationally-known brands of scaffolding.

You'll find WACO is the only scaffolding offering all these features as standard equipment *at no extra cost*. You'll find as thousands of other quality-minded contractors have found that WACO all-steel sectional scaffolding is recommended without reservation. Their unqualified acceptance of this safe, cost-cutting scaffolding is another proof of WACO's leadership in the scaffolding field.

Let this table tell you the plain truth about WACO Scaffolding. Let it tell you why WACO is your soundest scaffolding investment.

	WACO	BRAND A	BRAND B	BRAND C
Automatic fasteners as a part of all standard frames.	Yes	No	No	Yes
Floating type coupling pins for easy erection.	Yes	No	No	No
Built-in coupling pins on all frames.	Yes	No	No	Yes
All standard frames high carbon steel with built-in ladders.	Yes	No	No	No
Brace locks on the inside of frames.	Yes	Yes	Yes	No
High carbon steel pivoted cross braces.	Yes	Yes	Yes	No
Only one style bracket needed.	Yes	No	No	No
Number of parts for standard 5′ x 7′ section.	4	16	16	6



WACO | SALES RENTALS ESTIMATES

WACO MANUFACTURING COMPANY

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Armson Iron Works, Ontario, Canada

Waco-May Co., Los Angeles, Calif.

Hardfacing Triples Life Of Crusher Jaws

HARDFACING CRUSHER JAWS increase life by three times. Skip-welding is being used here, but other methods also are successful for extending crusher jaw life.

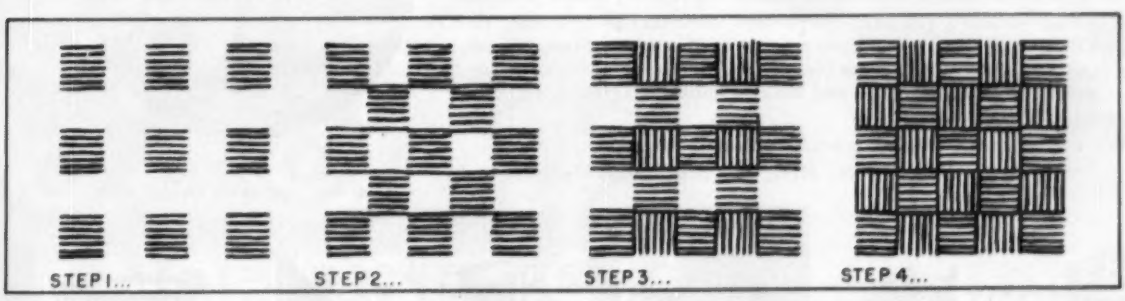
BUELLFLAT ROCK CO., Solvang, Calif., is averaging three times more service life from hardfaced jaws than from standard crusher jaws. Using Stoody Moly-Manganese electrodes, the firm has devised a method that eliminates the warpage usually associated with applying hardfacing to crushing surfaces.

H. D. Sutcliffe, maintenance welder for Buellflat, simply sets up three or four worn jaws at one time and skip welds from part to part. This prevents heat build-up at any one point—the cause of warpage. Corrugations are built up to within two passes of finish size. Each pass is peened and wire-brushed as welding progresses. Coated Tube Stoodite is applied as a final overlay, usually requiring two passes.

Worn crusher rolls are also built up by skip welding, using a checkerboard pattern. As illustrated in the sketch below, 3-in. square patches are used. To complete one pass, rolls must be revolved four times. The renewing job is accomplished while the rolls are in the crusher and during normal evening or weekend shutdown periods.

Buellflat does not permit the jaws or rolls to wear beyond conveniently repairable condition. It has been found that hard-facing alloys have helped materially to keep operations at peak efficiency at a fraction of past cost figures.

AFTER EACH WELDING PASS, the work is peened and wire-brushed. Coated Tube Stoodite is applied as final overlay. Jaws are not permitted to wear beyond repairable condition.



WORN CRUSHER ROLLS are renewed also by the skip welding method. A checkerboard pattern is followed, using 3-in. square patterns in a step-by-step method shown above. The crusher rolls remain in the crusher during the renovating operation.

In the Construction Industry...

SYMONS® CONE CRUSHERS

meet the demand for vast tonnages of fine aggregate and sand of proper gradation and quality

FOR DAMS AND HYDRO PROJECTS...

like the hundred million dollar Hungry Horse project at Kalispell, Montana, where the General-Shea-Morrison contracting group built one of the largest and highest dams in the country.
(Bureau of Reclamation Photo)

FOR MODERN EXPRESSWAYS...

like the modern Detroit Expressway, with its many interchanges designed for easy, safe access to this high speed highway . . . a good example of the big job being done by the construction industry to help meet the country's highway needs.
(Abrams Aerial Survey Corp. Photo)

FOR BRIDGE CONSTRUCTION...

like the famous George Westinghouse Bridge in East Pittsburgh, Pa. The 460-ft. center span of this bridge is the longest reinforced concrete arch in the United States—and stands as a tribute to the skill and ingenuity of the designers and builders.
(Portland Cement Assn. Photo)

FOR COMMERCIAL AND RESIDENTIAL BUILDINGS...

like the Park La Brea housing project in Los Angeles. Costing $40,000,000 and providing living quarters for 13,000 people, this unit is the largest architectural concrete project in the country.
(Portland Cement Assn. Photo)

• Illustrated here are just four examples of the vast contributions to the progress of mankind being made by the construction industry. With the advent of modern engineering and huge construction projects such as these, specification concrete aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate, Symons Cone Crushers have long been the first choice of leading producers throughout the world. In addition, Symons Cones are widely used for preparing sand to meet the rigid specifications prevalent in concrete construction.

For in aggregate and sand production . . . *as in all of the great ore and industrial mineral operations the world over* . . . there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of finely crushed product at low cost.

Long accepted by experienced contractors and producers for efficient stationary crushed aggregate plants, increasing numbers of successful operators of portable and semiportable crushing plants are now using these sturdy; economical Symons Cones for big capacity of fine product.

Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers . . . as well as the other Nordberg Machinery for the construction industry . . . *all* designed and built to deliver maximum output at lowest possible cost.

Write for literature on the machinery you need.

NORDBERG MFG. CO., Milwaukee, Wisconsin

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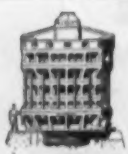


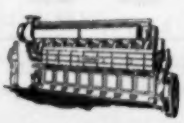
SYMONS PRIMARY GYRATORY CRUSHERS

SYMONS VIBRATING GRIZZLIES and SCREENS

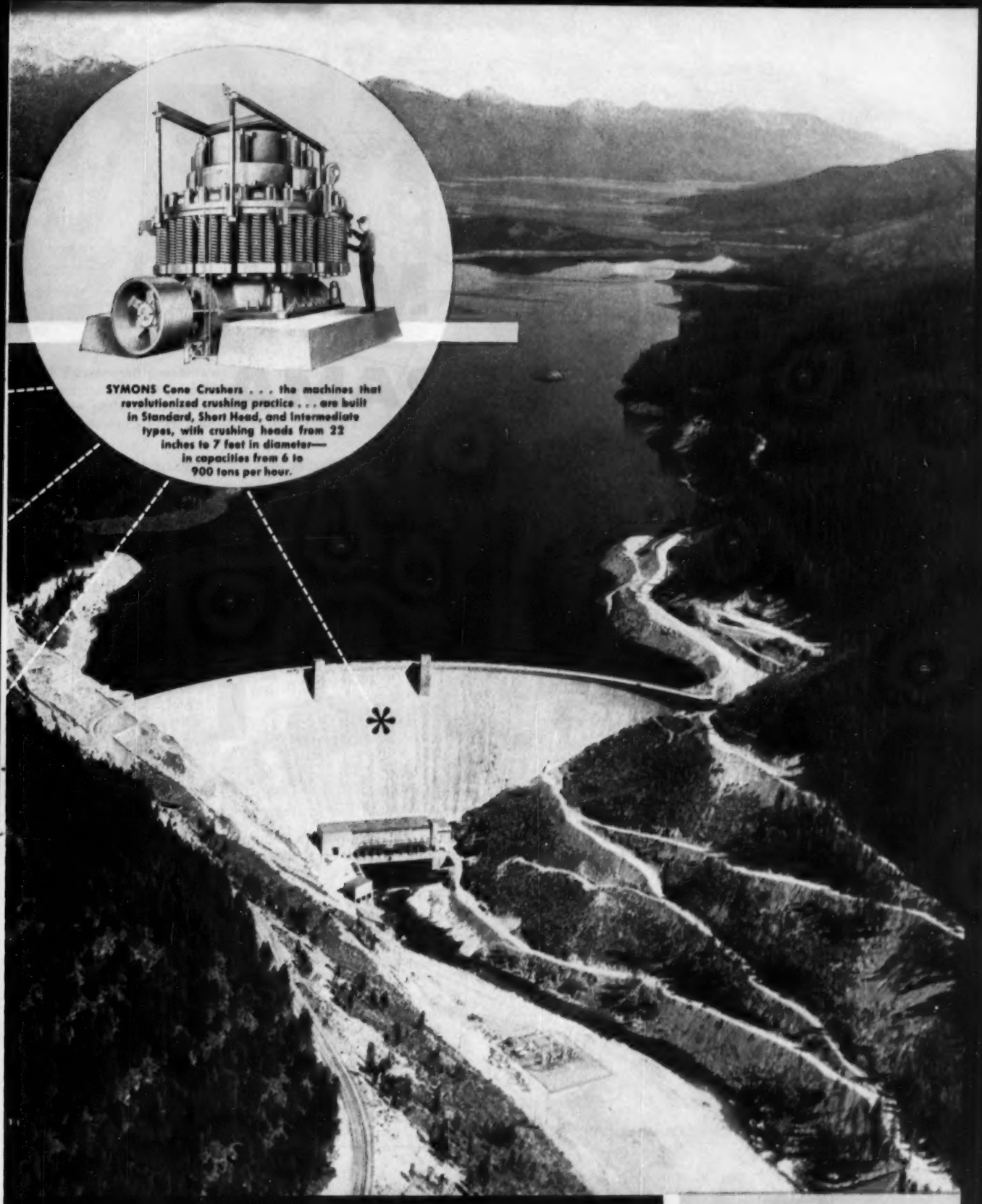
GRINDING MILLS

SYMONS V-SCREENS

ROTARY KILNS and COOLERS



DIESEL ENGINES — 10 to over 12,000 H.P.



SYMONS Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

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SYMONS...

A REGISTERED NORDBERG TRADEMARK
KNOWN THROUGHOUT THE WORLD

GYRATORY CRUSHERS GRIZZLIES and SCREENS

A Show you'll never forget!

GENERAL MOTORS POWERAMA

Gala Celebration of the 100 Millionth GM Diesel

LAKE SHORE SOUTH, CHICAGO—AUG. 31ST THROUGH SEPT. 25TH

GM Powerama presents—"roads a-building" exhibit of GM Diesel-powered equipment for both concrete and asphalt highway construction—dump trucks, concrete paver, rock crusher, graders, rollers and scrapers.

MAKE your plans now! The General Motors Powerama will be a national event too important, too spectacular to miss.

On 20 acres of grounds, a World's Fair of Power will unfold wonders galore. Fascinating exhibits—thrilling demonstrations—a colorful stage show—everything to make your visit interesting, educational and well worth the trip.

Come and bring the family. *Admission free!*

Plus many other interesting exhibits you won't want to miss—

ALLISON TURBO-JET and TURBO-PROP engines that power America's finest, fastest fighters and transports.

CLEVELAND DIESEL engines powering a submarine you can go aboard and inspect.

ELECTRO-MOTIVE's advanced lightweight 100-mile-an-hour train with its amazing new air-suspension springing.

EUCLID's full line of 10- to 50-ton Diesel trucks and 7-to 18-yd. scrapers.

FABRICAST's exhibit of modern casting methods.

GMC Diesel trucks and coaches, SceniCruiser and spectacular new "L'Universelle."

And a Complete Exhibition of GM's 7 Dazzling Dream Cars:

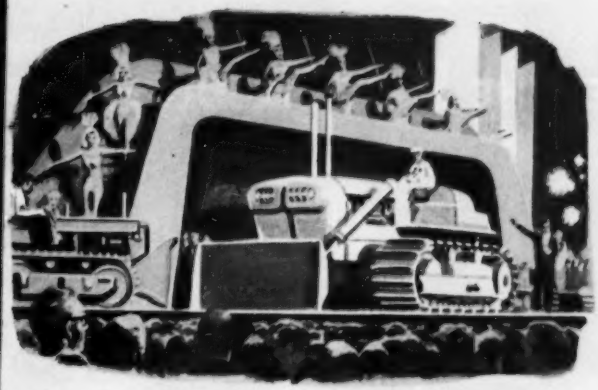
CHEVROLET BISCAYNE • PONTIAC STRATO STAR • OLDSMOBILE "88" DELTA • BUICK WILDCAT III • CADILLAC ELDORADO BROUGHAM LA SALLE II SEDAN • LA SALLE II SPORTS CAR

GM GENERAL MOTORS DIESEL POWER

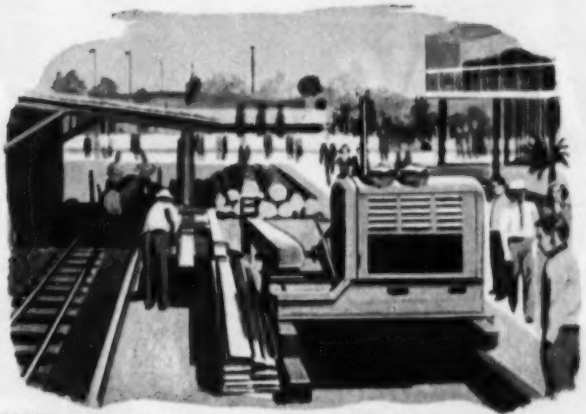
DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

In Canada: General Motors Diesel, Ltd., London, Ontario



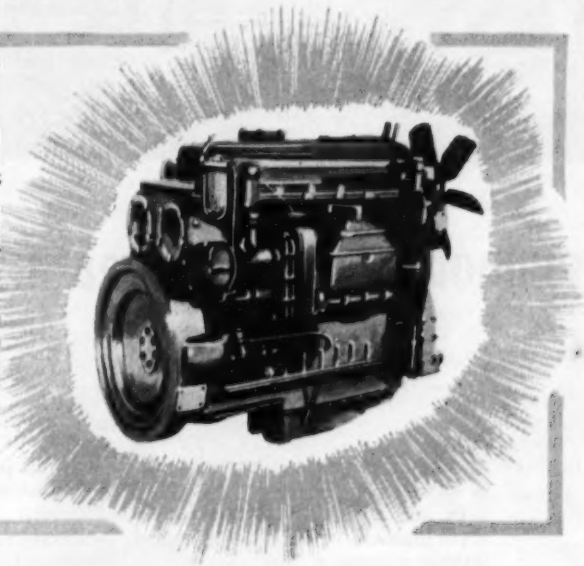
GM Powerama presents—"More Power To You"—a mammoth variety show in which Diesel-powered vehicles perform fantastic maneuvers—with Big Top circus acts and a huge cast of dazzling dancing starlets.



GM Powerama presents—a wide variety of interesting, *operating* exhibits showing the use of Diesel power in many fields including a sawmill, a cotton gin, an irrigation system, a farm tractor and a feed mill.

Horsepower

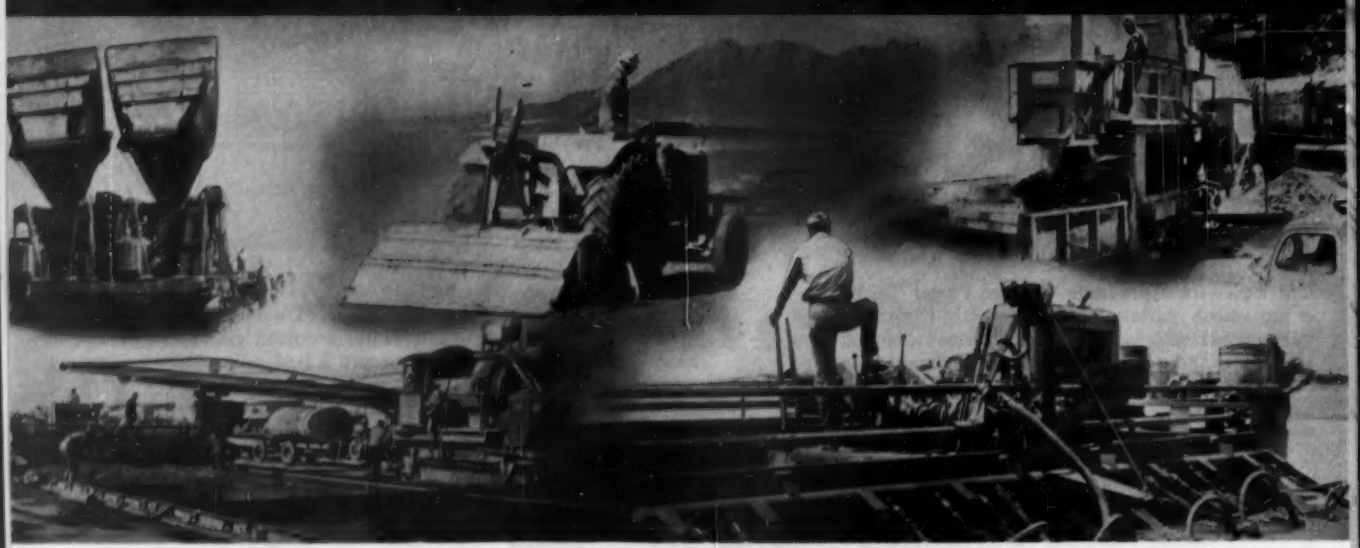
GM Powerama presents—at the head of the parade—Detroit Diesel's golden "6-71" Diesel engine (representing 100 Millionth General Motors Diesel H.P.). Also, Dr. Diesel's first engine and exhibits ranging from the 1933 World's Fair Diesel engine to the compact new "51" engine that opens new fields for Diesel usefulness.



GM Powerama presents—a marine display including GM Diesel-powered shrimp boat and 36-foot and 22-foot pleasure craft for the interest of those who want Diesel safety, speed and economy in their boats.

GM Powerama presents—a modern, portable oil-well drilling rig in action, powered by General Motors 2-cycle Diesel engines which have won a reputation for "more power in less space with less weight."

PAVING...How to Get the Best Results



1. Bituminous Surface Treatments

By BERNARD E. GRAY
Former President, The Asphalt Institute

With this article CM&E begins another series on subjects of major importance to contractors. Paving is a field of rapidly developing technology. In these articles, outstanding experts in the use of Portland cement concrete, stabilized soil and all types of bituminous paving will contribute their specialized knowledge for our readers.

SURFACE TREATMENT OF ROADS with bituminous materials will be a big field for contractors during the next decade. Today about one-third of the 900,000 mi of all-weather roads in the U.S. are surface treated. By 1965, there probably will be something like 1,400,000 mi of surface-treated roads.

The nation's untreated highways include about 1,200,000 mi of traffic-bound stone, gravel or stabilized earth roads and an equal mileage of partially graded and drained earth roads. Not all of these roads will warrant improvement, but the potential market for bituminous surface treatments still is immense.

In addition, there is a trend in state highway departments toward letting surface treatments to contract. A recent check with several large state highway departments indicates that contract work for bituminous surface treatment ranges from 25% of annual surface-treated mileage to as much as 70%. Available specifications for procedures need only minor modifications to place surface treating on the same contract basis as any other type of work.

Surface treatment is a term employed to describe the several methods of applying liquid bituminous materials to roadways for the purpose of hardening, evening and waterproofing. The resulting thickness ranges from ¼ to ¾ in.

Terms such as armor coat, penetration, seal coat, tack coat and prime coat are simply more specific descriptions of a process. Armor coat, a term used in the West, is a heavy surface treatment. Penetration, a term used in the South and Southwest, is similar to armor coat but is not to be confused with penetration macadam, an entirely different type that will be described in a subsequent article. Seal coats are very thin surface treatments, usually less than ½ in. thick, applied over previously constructed pavements for the primary purpose of waterproofing. The final application of asphalt in heavy treatments often is called the seal coat. Tack coat is a light application to an existing pavement to seal cracks and insure bond with a plant-mix overlay. Prime coat is simply the first application of asphalt in an original surface treatment.

For Long Life

Surface treatments usually are low-cost, but they require skillful engineering and good construction control. A properly laid surface often will have a useful life of 15 yr before it needs retreatment. A useful life of 8 to 10 yr is commonplace. But a carelessly laid pavement may need extensive repairs within one year.

(Continued on page 85)

The Engineer's Report

CASE HISTORY

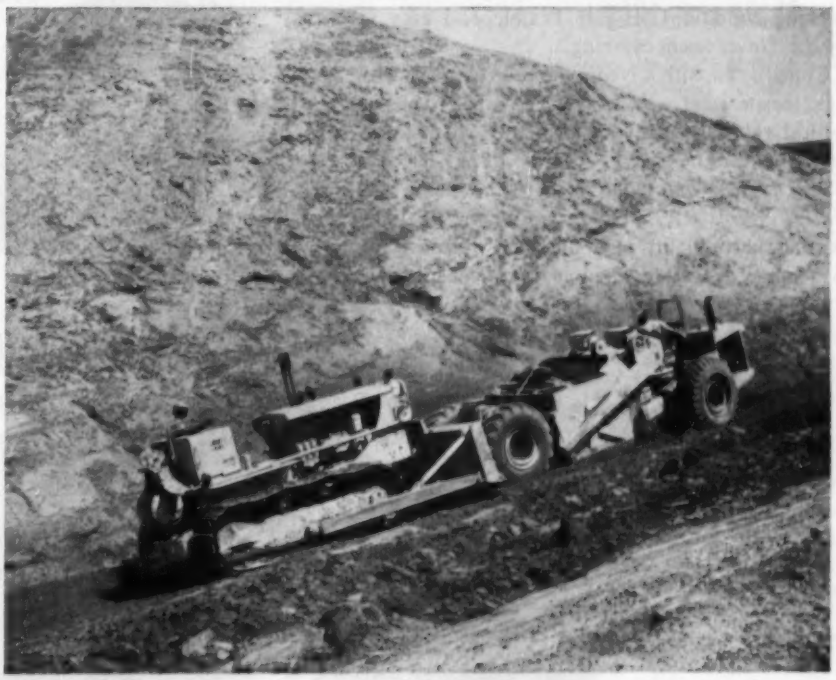
PRODUCT RPM Tractor Roller Lubricant

FIRM J. Tomei and Sons, Van Nuys, Calif.

Track bearings good after 10,550 hours' tough work!

WORKING IN GRITTY DIRT with much side-hill operation, a dozer like this went 10,550 hours on a single set of track rollers, lubricated exclusively with RPM Tractor Roller Lubricant. The rollers were then replaced, but only because flanges were worn off. The bearings themselves were still in good condition, even after such extended service.

J. Tomei and Sons, Van Nuys, California, have used only RPM Tractor Roller Lubricant in track bearings since 1937. They report it gives them service like this in all their equipment even though most work is building roads through the highly abrasive decomposed granite of Southern California. They find it helps seal grit out of the bearings, tends to float away any dirt that does get into them, and won't squeeze off under extreme loads.



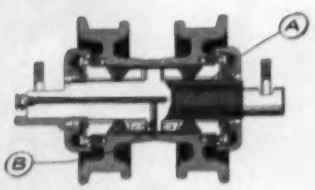
REMARKS: Three grades of RPM Tractor Roller Lubricant meet all climatic and operating conditions in Caterpillar-type track roller bearings. For Allis-Chalmers bearings, RPM Tractor Roller Lubricant A/C Type is recommended.

FOR MORE INFORMATION about petroleum products of any kind or the name of your distributor, write or call any of the companies listed below.

RPM

TRADEMARK "RPM" REG. U.S. PAT. OFF.

How RPM Tractor Roller Lubricant resists wear in the toughest service



It flows evenly to all bearing surfaces, lubricates and retards rust formation.

A. Contains chemical anti-wear agent—maintains tough lubricating film.

B. Has stringiness compound—improved viscosity, resists leakage, helps keep protective grease seal outside bearings.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

BUILT TO BE ABUSED...

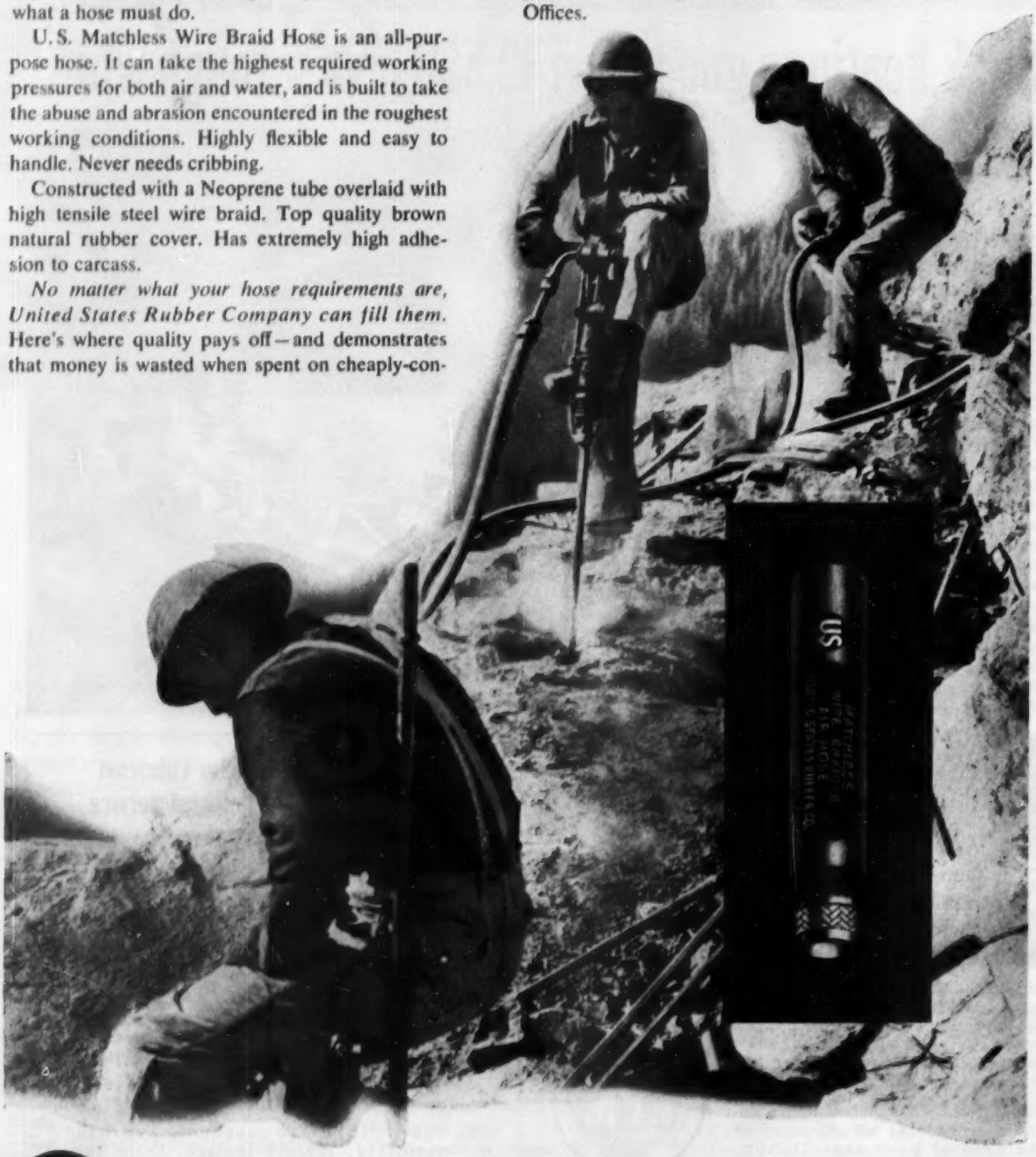
It's U. S. Matchless® Wire Braid Air Hose!

This is the hose engineered specifically for hard rock mining, quarrying and tough construction work anywhere in the world—designed by men who *know* what a hose must do.

U.S. Matchless Wire Braid Hose is an all-purpose hose. It can take the highest required working pressures for both air and water, and is built to take the abuse and abrasion encountered in the roughest working conditions. Highly flexible and easy to handle. Never needs cribbing.

Constructed with a Neoprene tube overlaid with high tensile steel wire braid. Top quality brown natural rubber cover. Has extremely high adhesion to carcass.

No matter what your hose requirements are, United States Rubber Company can fill them. Here's where quality pays off—and demonstrates that money is wasted when spent on cheaply-constructed, short-lived hose. Expert "U.S." engineers will aid you in your hose selection and engineering problems. Call any of the 27 "U.S." District Sales Offices.



"U.S." Research perfects it . . . "U.S." Production builds it . . . U.S. Industry depends on it.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

MATERIALS

Table 1 . . . Approximate quantities for original treatment of loose granular surfaces (Asphalt Institute Spec. S-3)

Grading Requirements for Aggregate Cover

Total Passing	% by weight
¾-in. sieve	100
½-in. sieve—not less than	75
No. 200 sieve—not more than	10

Quantity — Mineral Aggregate

	lb per sq yd
Over primer and blended with binder	25-40

Quantity — Asphalt

	gal per sq yd
MC-2 or SC-2 primers	0. 5 to 0.8
RC-1, RC-2 or SC-3 binders	0.25 to 0.4

Table 2 . . . Approximate quantities for original treatment of tightly bonded surfaces, using cutback asphalts, road oils and asphalt cements. (Asphalt Institute Spec. S-2)

Treatment	(1) Light	(2) Medium	(3) Heavy
Grading Requirements for Aggregate Cover			
Total Passing	% by weight	% by weight	% by weight
1-in. sieve		100	100
¾-in. sieve	100	90-100	90-100
½-in. sieve	90-100		20-55
⅜-in. sieve	40-70	20-55	0-15
No. 4 sieve	0-15	0-10	0-5
No. 8 sieve	0-5	0-5	
Quantity — Mineral Aggregate (lb per sq yd)			
Over MC-0, RC-0 RC-1 or SC-0 primers	sand not over 5	sand not over 5	sand not over 5
With MC, RC, or SC binders	25-35	35-45	45-55
With AC binders		45-55	55-65

	Asphaltic Materials		
Primers	MC-0, RC-0 SC-0	same	same
Cold application	RC-1, RC-2		
Hot application: (a) Non-absorbent aggregate	RC-2, RC-3	RC-4 AC200-300	RC-5, AC150-200
(b) Absorbent aggregate	MC-3, SC-3	MC-4 and SC-4	MC-5 and SC-5
Quantity — Asphaltic Materials (gal per sq yd)			
Primers	0.3-0.8	0.3-0.8	0.3-0.8
Binders	0.25-0.35	0.35-0.45	0.45-0.55

Table 3 . . . Approximate quantities for original treatment of tightly bonded surfaces, using emulsified asphalt (Asphalt Institute Spec. S-5)

Grading Requirements for Aggregate Cover

	First Application	Second Application
Total Passing	% by weight	% by weight
1-in. sieve	100	
¾-in sieve	90-100	
½-in. sieve		
⅜-in. sieve	20-55	100
No. 4 sieve	0-10	85-100
No. 8 sieve	0-5	10-40
No. 16 sieve		0-10
Quantity — Mineral Aggregate (lb per sq yd)		
Over primed surfaces		not over 5 (or sand)
First application	25-35	
Second application		10-15
Quantity — Emulsified Asphalt		
RS-1 binder	0.2-0.3	0.4-0.5

NOTE: If roadbed is very dry, first apply water at 0.15 to 0.35 gal per sq yd followed by RS-1 primer at rate of 0.2 to 0.3 gal per sq yd.

First, the Base

When should an untreated surface be changed to an all-weather type? The temptation is to surface treat whether or not a real foundation exists. This has created many miles of surface-treated highways with little or no base, which are a source of constant trouble and expense.

A road is no stronger than its base. If there is no base, do not lay down a heavy surface. Instead apply a dust layer and be prepared to maintain the surface by blading, just as with an untreated road. This prevents endless patching, one of the most costly maintenance items. The dust layer will hold down the summer dust, and small yearly additions of granular material can result, over a period of years, in sufficient stabilization that a year-round durable treatment can be applied. Where immediate change to an all-weather surface is necessary, a sound base must be constructed first.

A surface treatment is not a pavement in itself. Rather it makes the base a pavement by waterproofing and providing resistance to the abrasion of traffic. A treatment that merely rests on the top of the roadbed will behave much like a loose, thin carpet on a floor; it will wrinkle and displace.

The successful surface treatment must be thoroughly tied down. You can accomplish this by making two or more applications of asphaltic material, the first designed to penetrate and coat the dusty base and the second to seal it and hold the aggregate cover. The quantities of asphalt required will depend on the density of the base and the absorbent qualities of the cover. For superior results it is just as necessary to proportion materials properly in surface treatment as in any other type of surfacing.

The Asphalt Institute, after a long study of procedures in several states, has prepared Tables 1, 2 and 3 to show the approximate quantities required. The quantities in these tables are the outside limits. More exact figures should be determined after a study of job conditions. Careful study of local conditions will make possible exact estimates of material requirements and result in improved job planning and cost analysis.

Weather conditions are an important factor in the success of a treatment. A certain amount of curing, or "set-up," is required with even the heaviest liquid asphaltic materials. This curing takes place best when the roadbed is just slightly damp and the air temperature is well above 50 deg. After the treatment is completed, an additional period of warm, dry weather is needed for further curing and set under traffic.

It is possible to do good work in cool or even cold weather, but it costs much more and requires many precautions. A survey of sur-

(Continued on page 88)

KOEHRING COMPANY
Milwaukee 16, Wis.
Subsidiaries: JOHNSON
PARSONS • KWIK-MIX

Measure excavators by
price per pound of lift capacity

In analyzing shovel operation, you will find that price per pound of lifting capacity on crane rating is also an excellent measurement of excavator value.

Remember, lift capacity is *work capacity*. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength, extra speed and stability to handle bigger loads faster with every excavator attachment.

Check Koehring lift ratings shown below — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.

Compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

*Figures available on request—ask your Koehring distributor to see them.

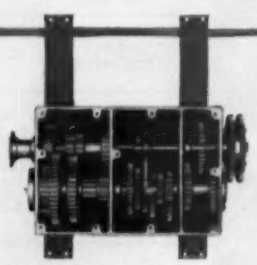
"This Cleveland 140 is a diggin' fool"

SO SAYS OWNER, Frank C. Heckman, Excavating and Trenching Contractor of Santa Fe, New Mexico. His Cleveland is here shown digging trench for the installation of sewer, water and gas lines in a new building project in Santa Fe. Each house requires a total of about 300 feet of trench, all 20 inches wide but varying in depth down to 4 feet.

Heckman does all the trenching for this construction company which erects about 200 buildings yearly in Santa Fe. In addition he does many scattered trenching jobs throughout the Santa Fe area, much of it for utility companies.

He's sold on his Cleveland's speed and maneuverability for digging short runs of trench profitably and on its rugged dependability for turning out high daily production on pipeline and similar big jobs.

This famous Cleveland multi-speed transmission *has no equal.* It provides 12 individual crawler speeds for each of 4 digging wheel speeds—gives you the *right* speed and power *combination* for *every* trenching job *condition.*



Your local distributor will show you how Clevelands do more—for less

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND

BITUMINOUS SURFACE TREATMENT

Continued from page 85

face treatments rated excellent shows more than 85% were placed in June and July. On the other hand, nearly 60% of the treatments rated poor were placed after September. Every effort should be made to plan work for fast operation in the early summer.

Equipment

The durability and flexibility of equipment for surface-treatment work has improved considerably. But there still is room for more improvement, particularly in the operation of bituminous distributors.

Since World War II, when rail delivery within a 200-mi radius was prohibited, the trend has been toward truck transport of asphalt, even at distances of up to 500 mi. Faster terminal handling and better delivery scheduling now make truck transport the preferred method. Trucks often are insulated and equipped with heating flues and pumps so that the asphalt can be ready for immediate use when it reaches the job site.

For rail delivery, rapid tank car heaters are available. Modern types can produce the needed heat in 30 min from a cold water start and will raise the temperature of a 10,000-gal tank car from 10 to 20 deg an hour with fuel consumption of about ½ gal per deg per 10,000 gal.

The asphalt distributor is the key piece of equipment for surface treatments. Distributors are made in sizes ranging from 600 to 2,500 gal; a few are even larger. Most are 1,000 to 1,250 gal, but there is a trend now toward larger sizes. A distributor is an expensive piece of equipment, and it should be used for distributing rather than for transport. There is no exact agreement as to the critical distance beyond which it is more economical to leave a distributor on the job and do hauling with a tank truck. Most users employ trucks if the haul is more than 5 mi; a 10-mi haul is the maximum for a distributor.

If there is one word that describes a good treatment it is uniformity; each square yard of the roadbed must get the same amount of asphalt and aggregate. Before the start of work, you should check the spray bar by placing strips of paper longitudinally the width of the bars, then spraying and finally

(Continued on page 91)

MIANUS RIVER DAM and Reservoir, Greenwich, Fairfield Co., Conn., for Greenwich Water Co. Merritt, Chapman & Scott Corp., *Contractors;* American Water Works Service Co. Inc., Phila., Pa., *Consulting Engineers;* DeLeo Bros., Inc., Stamford, Conn., *Excavation Sub-contractors.*

On Mianus River Dam, Greenwich, Conn.

IT'S MACKS 100%

This project, which is being built to insure an adequate water supply for Greenwich, Conn., Port Chester and Rye, N. Y., involves moving 375,000 cubic yards of earth and rock fill.

The dam itself will be 1,200 ft. long, 77 ft. high, 430 ft. across at the base and 20 ft. across at the top. As Mr. Sam DeLeo of DeLeo Bros., Stamford, Conn. excavation contractors, puts it, "We've got a real earth-moving job here, all right.

"To do the best job, and to be sure we fulfill our contract on schedule, we're relying on Macks.

"Ours is a Mack fleet, exclusively. Moreover, the additional trucks we've hired to increase our hauling capacity on this job are Macks. In fact, with us, it's Macks all the way."

DeLeo Bros., like so many heavy construction contractors, have used Macks for years. They know that Macks keep cycle time down over the toughest terrain. Fast, uninterrupted schedules are assured, thanks to Mack's Balanced Bogie and exclusive Power Divider . . . the combination that provides maximum flexibility, even tire loading, uniform braking and positive traction in soft or slippery going.

In addition, the fact that Mack makes more of its own components than any other manufacturer means that Macks are built better from the axle up. They're stronger, require less maintenance, assure longer service life. As Mr. DeLeo says: "It pays to invest in Macks."

MACK TRUCKS Empire State Building, New York 1, N. Y. 3130

(Advertisement)

ATHEY HiLOADER CUTS LOADING COSTS 50%

Easier, Faster Truck Spotting
• Fast Loading
• Speedy Maneuverability from Stockpile to Stockpile
• Minimum Downtime

Above are the reasons the Athey Model 125 HiLoader cuts loading costs 50% for Standard Materials Corporation, Indianapolis, Indiana. The Athey HiLoader is located at their gravel and stone quarry at Clinton, Indiana. The machine averages 200 tons per hour, but has hit 3500 tons in a 9 hour day. This adds up to a neat 50% savings in loading costs in comparison to the shovels, cranes and other makes of loaders previously used.

What about you? Do you have a need for a speedy, rugged stockpile loader in your business? Then have your Athey-Caterpillar dealer point out these features . . . and many more: wide moldboards reach out to pull in large windrows or dig into a stockpile. Heavy-duty clutch for maintained crowding action. Exclusive full-floating feeder that rises and falls with the contour of the windrow or load being handled. Fast-moving, rubber-covered conveyor belt. All action controlled hydraulically from the operator's seat. Big capacity, up to 10 cu. yds. per min. in free-flowing material; up to 25 cu. yds. per min. in snow. Swiveling discharge conveyor swings to any position either side or straight back, permitting fast spotting of trucks.

Put the Athey HiLoader to work on your next materials handling job! You'll be glad you did!

Athey APCOR Products

ATHEY PRODUCTS CORPORATION
5631 West 65th Street
Chicago 38, Illinois

POWER BROOM and pneumatic-tired roller move loose cover toward center of road, not fully covered from truck-gate spreading.

comparing the weight of each strip. If the weights vary by more than 10%, the distributor needs overhaul.

Expert operation and control are necessary even with the best equipment. It should be mandatory to lay down building paper at the start of each distributor load to take care of transverse overlap. Skipped areas should be hand-sprayed immediately. Nozzles must be checked frequently to assure that they are at the proper height above the road surface and working fully. All too often a good job is spoiled because one or more spray nozzles were partially or completely clogged.

Check Frequently

When the proper operation of the distributor is so important to the success of the job, it's just not possible to check it too often. You should watch the valves to see that their action is instantaneous both in application and in cut-off. When you are applying emulsified asphalts, you should remove the screens in the distribution line. At the end of each day's work, you should see that the lines are cleaned thoroughly, with kerosene, if necessary.

Aggregate spreaders also need careful control. The aggregate always should be spread over the fresh asphalt before the spreader truck wheels come upon it. Where work is done under traffic, no vehicle should exceed 15 mph maximum speed. The best policing method is to form single-line traffic behind a pilot car with red flag stops at each end of the job.

A common fault is to operate the distributor too far ahead of the ag-

(Continued on page 94)

CHECK THESE SUPERIOR FEATURES!

1. Sealed gear box, lubricated for life (unconditionally guaranteed for 1 year)
2. Vibrationless action
3. Timken bearings on main shaft
4. Roller bearings on cross shaft
5. Twice former bearing surface on gears
6. Heavier stationary guard ring (works within 1" of obstruction)
7. 1 piece blades, easier replacement
8. New cast alloy steel arms
9. Takeup slots for easily regulated belt tension
10. Corrosive-resistant tough paint in pleasing colors
11. New control crank, easy pitch adjustment
12. Unusual handle design centers pitch blade control

These features are retained!

Floating & troweling blade combination (1 set of blades for floating & finishing)
Tangential arm mounting, 4 point suspension (greater stability, accurate running balance)
4 blades for truly level floor
Mercury switch for greatest safety
Distributors, dealers throughout U.S.
Parts and service always available.
Electric models available.

Superior Cement Tool Corp.
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Send specifications on Superior Cement Tools. Please have sales representative call on me.

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GAR WOOD

Presents

'EQUIPMENT THAT SUITS THE JOB'

. . . The Gar Wood '75' line of ¾ yard excavators, in both standard and heavy-duty models and 20-ton truck crane, have ably and economically handled a wide variety of jobs. Check the many Gar Wood advantages before placing *any* order!

Quarry work...

Gar Wood's independent travel while swinging permits faster moves away from rock slides to increase safety factor. Drop ball can operate from second drum without hooking to bucket teeth. Less wear and tear because fluid coupling operates to meet varied rock conditions.

Sand and Gravel...

Full dippers and fast loading pay off on sand and gravel work. Gar Wood's positive independent chain crowd gets full engine power into the load — dipper retracts at twice the crowd speed. Power actuated drum clutches cut operator fatigue — get more tons loaded per day.

Concrete work...

Concrete work requires the same smooth, precision operation necessary on steel erection and a Gar Wood '75' can position buckets to perfection. The 75BT, heavy-duty truck crane, is extremely mobile — both on the job and on moves from job to job—saves time, cuts costs!

Steel Erection...

Boom lengths up to 80′, with tip extension if required. Optional fluid coupling, power operated drum clutches and direct drive with optional power load lowering, combine to permit smooth, precision work. Truck crane has folding boom for quick, easy moves in traffic.

Drainage Canals...

Faster swings, smoother operation, *plus* self-cleaning crawlers for marshy terrain, add up to more work daily when used as dragline or clam. Low-mount, back-hitch gantry offers all the advantages of high gantry when long crane booms are needed for extra long reach.

Foundation Borer...

Only Gar Wood offers this new, profit making tool! Combines boring and belling into one streamlined operation for low cost construction of unreinforced foundation footings, caissons, piers, piles, wells, wall supports, etc. Factory installed to order. Completely convertible.

ASK FOR A DEMONSTRATION

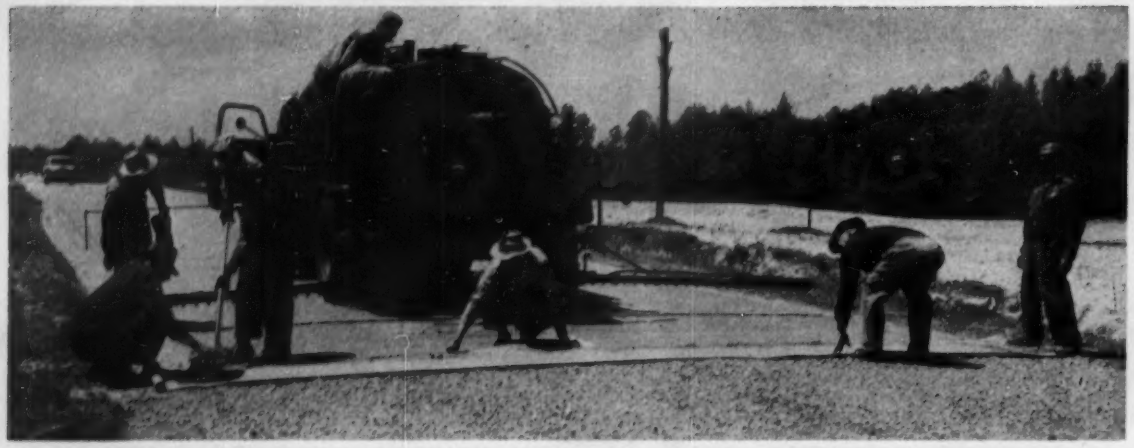
Gar Wood

SHOVELS-CRANES TRENCH HOES

. . . Distributors throughout the country will gladly show you how Gar Wood performance puts profits in your pocket!

GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

No. 551



PLACING BUILDING PAPER at the start of each distributor load prevents transverse overlap of asphaltic material. Check the nozzles of the distributor frequently to be sure they are at the proper height above road surface and operating fully.

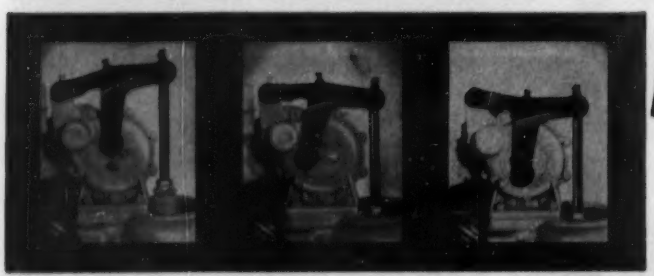
gregate spreader. In warm weather, the time lag usually should not exceed 10 min. In cool weather or with rapid setting products, it should be less than 5 min.

A steel-faced roller weighing not less than 5 tons should do the first rolling. Either three-wheel or tandem rollers are satisfactory, but they should not be too heavy. Steel-faced rollers of 5 to 8 tons usually are adequate. Pneumatic-tired rollers are a great help in producing uniformity across the full width of the roadway. They should be used particularly over the outer quarters of the surface, the area used least by traffic.

Construction on Loose Surfaces

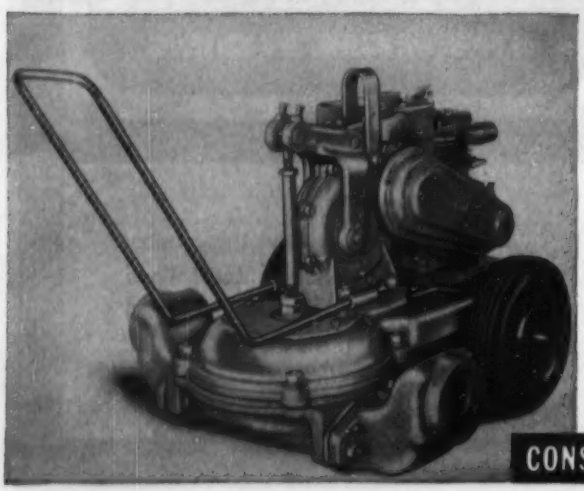
Loose surfaces include such materials as cinders, sandy-gravel and traffic-bound macadam. The base materials are loosely bonded together even though the shape and character of the individual particles give it high stability. A surface treatment that adequately bonds sandy-gravel also is satisfactory for other types of loose surfaces except for adjustment of the amount of bituminous material.

(Continued on page 97)



Exclusive variable-speed, vertical-stroke plunger design makes this pump outperform, outlast all others!

New CMC SKWEE-GEE Diaphragm Pump



Now a combination 2" and 3" pump that's the best in the business for jobs ranging from de-watering to pumping sludge. Actually the modern successor to cranky diaphragm pumps!

SKWEE-GEE primes dry at 25 feet. Total heads up to 40 feet. Standard plunger stroke 3" with alternate 2¾" by simple adjustment. Lightweight, more compact, easier to move about. Write for Bulletin FD-L3.

Also 1" to 10" DUAL PRIMERS

Get the latest money-saving facts
WRITE FOR
FREE ILLUSTRATED PUMP LITERATURE

CONSTRUCTION MACHINERY CO., Waterloo, Iowa

COSTS LESS

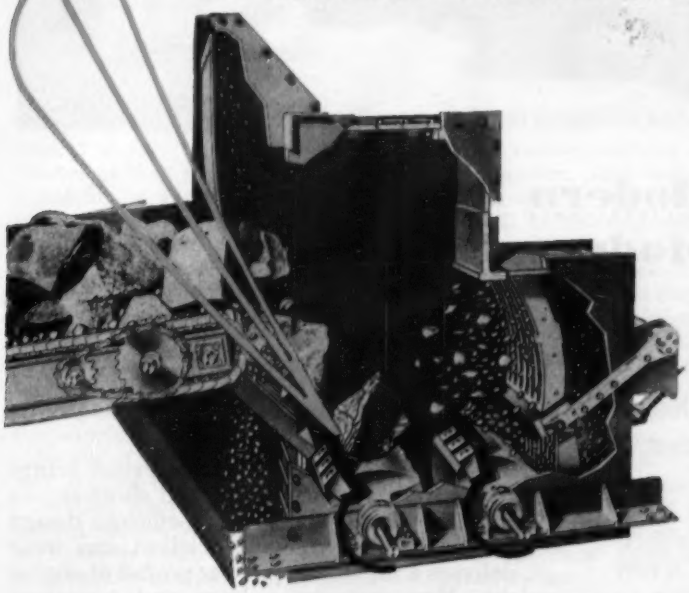
High ratio of reduction. One machine does combined primary and secondary reduction job . . lower initial cost.

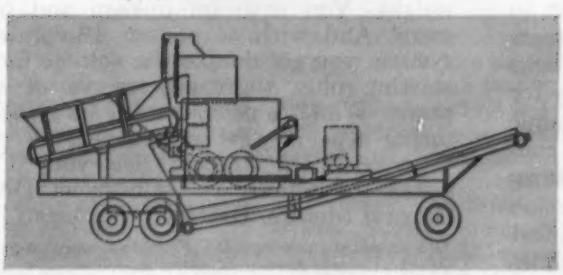
BREAKS CLEANER, FASTER

Two hammer rotors turn in the same direction . . . . eliminate congesting of breaker, promote faster feeding, faster discharge, increased capacity.

UNIVERSAL IMPACT MASTER

Featuring Universal's exclusive operating principle: Controlled Impact Action.





Portable Impact Master with apron feeder, folding discharge conveyor, three-speed transmission, and power.

It's no wonder Universal's Impact Master is the most efficient breaker you can buy. It can eliminate secondary crushers, take shovel-loaded run-of-quarry rock and reduce it to finished size in three seconds.

Here is why the Impact Master breaks rock faster and more economically. Both rotors turn in the same direction, assuring straight line flow of broken material away from hammers. Radial feed and absence of congestion provide unrestricted penetration of rock into the hammer circle for perfect impact. Hammers are always clean, always ready to break incoming rock most efficiently.

This saves you money because fewer hammer blows are required to do the job . . . less wear throughout machine . . . less horsepower.

Result: increased capacity of clean, cubical aggregate. What's more, finished product size is controlled easily with simple mechanical adjustments.

Universal's Impact Master provides capacities up to 1000 tons per hour. Get complete profit-making facts now. Write for literature.

Available in portable or stationary set-ups.

CONTROLLED IMPACT

The method of impact breaking which permits control of feeding, breaking and product size.

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Get both in new Chevrolet Task-Force trucks. Modern styling that actually works for you! Modern power in the shortest stroke V8's* in any leading truck!

Styling that's designed to make money for you—It's a fact. The ultra-modern, Powermatic design of a new Chevrolet Task-Force truck calls attention to your business, favorably impresses customers and prospective customers! That's why on looks alone a Task-Force truck can make money for you. And it's *functional* styling. Panoramic windshield, new High-Level ventilation, concealed Safety Steps—these are styling features that double in brass to make the driver's job less of a chore. With safety and comfort increased, efficiency goes up. Tight schedules are easier to maintain and you keep the profits coming in on time.

V8 power—unmatched for efficiency!—Chevrolet brings you the industry's most advanced short-stroke V8 engines! The compact, super-efficient design of these great V8's reduces friction and wear . . . delivers a higher output per pound of engine weight. You save on upkeep and operating costs! And with a modern 12-volt electrical system, you get double the voltage for quicker starting plus a greater reserve of electrical power. *With two power-packed V8's and five gas-saving 6's—it's the greatest engine choice in Chevrolet truck history!* See your Chevrolet dealer for details. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**V8 standard in the new L.C.F. models, an extra-cost option in all others except Forward-Control models.*

NEW CHEVROLET Task-Force TRUCKS

SPREADING AGGREGATE by backing the truck keeps the trucks's wheels from running over fresh asphalt. When work is done under traffic no vehicle should exceed 15 mph.

This varies with the porosity of the aggregates; some aggregates are so absorptive they require almost twice as much as others.

Untreated roads with loose surfaces usually are maintained by "mulch" treatment — frequent blading to keep a floating cover, at least 1 in. deep, in place. Before treatment they should be consolidated to the greatest degree possible. Any remaining loose material should be bladed to the shoulder.

Then, the base should get a prime coat—all it can absorb. The aggregate cover need not be exactly graded. Manipulation by blading and dragging will produce a uniform condition. In many cases, the material previously bladed to the shoulder is satisfactory. The objective is to produce a smooth, well-bonded layer.

Several days traffic over the primed surface will afford an opportunity to make any needed repairs before the seal coat is applied. Weak places in untreated loose-type surfaces often do not show unless they are serious enough to cause an actual breakup. But after bituminous treatment, every area that is too thin or is not uniformly compacted shows up at once. These areas should be completely reconstructed before placement of the seal coat.

The seal coat has an entirely different purpose and function from the prime coat. It is not intended to penetrate except to such a minor extent as will insure sound bond with the asphalt primed base. The asphaltic material used generally should be one that cures slowly enough to permit some manipulation of the cover. This will insure a mixing of the aggregate and the asphalt binder to a uniform condition. Rolling, particularly with pneumatic-tired equipment, should be continued until the final set has taken place.

Construction on Bonded Surfaces

Bonded surfaces include water-bound macadam, sand-clay, lime-rock, clay-gravel, top soil, shale, chert, shell, caliche and other materials bound together by a cementitious mineral dust or clay binder. With these materials a strong base can be formed by wetting, dragging and blading.

Bonded surfaces do not require as much priming manipulation as loose surfaces. But the bonded base must be swept clear prior to prime application. The base should be completely free of loose dust. It should be cleaned to at least 8 in. beyond the outer edge before the prime spread to insure a clearly defined border.

For bases containing substantial amounts of 200-mesh material, the primer should be a medium or slow curing type, one that will penetrate quickly and set to a firm condition. Other bases—disintegrated granite, for example—contain little 200-mesh material but bond by friction and interlock of particles. Such bases require a prime that is more rapid curing; a slow-curing prime tends to break the bond rather than improve it. Little or no cover coat is needed because the base should absorb the entire amount. This primed base should not be under traffic any longer than necessary to complete absorption of the primer.

The seal coat material may be

Take all tools and supplies to the job!

It's pretty expensive to hold up the job while somebody runs back to town for a special tool.

But now a contractor can take *all* his tools and supplies to the job—and keep his pickup free for other useful trips. Because a WELLS CARGO provides 4-ton extra capacity, 112 sq. ft. of floor space, over 710 cu. ft. of enclosed cargo space. There's plenty of room for all your equipment.

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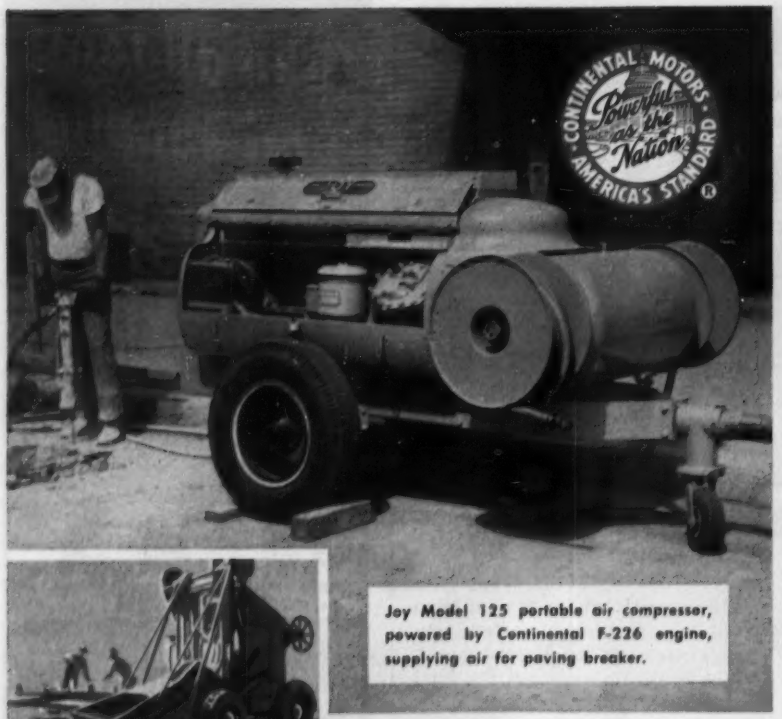
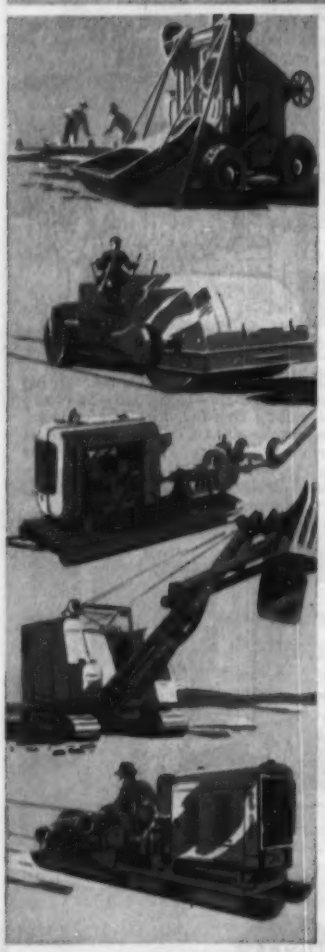


Joy Model 125 portable air compressor, powered by Continental F-226 engine, supplying air for paving breaker.



Speed the Job ...Cut the Cost with DEPENDABLE RED SEAL POWER

Continental Red Seal power is saving money for owners of specialized equipment in all phases of the construction industry. You find Red Seals of varying sizes and specifications (14 to 237 horsepower—for operation on all standard fuels) in more and more leading makes of compressors, mixers, rollers, pumps, shovels, winches, and other machines at the job site. And you find them delivering their full work quota, with a minimum of down time, because each is engineered expressly for its job—built to do one thing and do it well.

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1282 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

BITUMINOUS SURFACE TREATMENT

Continued

hot asphalt cement, a rapid-curing cut-back, an emulsified asphalt or a heavy SC product. A recent questionnaire to state highway departments showed a trend toward the use of heavier grades of asphalt for original treatments. The heavier material makes possible the use of larger size aggregate cover and produces a finished mat of maximum practicable depth.

Usually, seal coats are made in two applications. With exceptionally uniform-quality aggregate, sealing may be accomplished with one seal application of asphalt and a single cover of large size aggregate. But usually there is too much chance of size segregation so that fat and lean spots show in the completed work. There is little, if any, additional cost in making two applications of seal coat. And it assures that the texture of the finished roadway will be uniform.

Summary

To assure the success of surface treatment work, follow these rules:

1. Prepare a base of adequate thickness, well consolidated from center to shoulder and fully drained.

2. Apply the bituminous material in warm weather, if possible, and make arrangements to insure a continuous flow of materials once work is under way. Reserves of aggregate and asphalt sufficient for several days of operations should be provided if there is any doubt about availability of materials. Nothing costs more than idle personnel and equipment. And good weather lost is gone forever.

3. Check and recheck the distributor to see that it is operating properly. One or two clogged nozzles can reduce substantially the useful life of the treatment.

4. Keep traffic to a maximum speed of 15 mph on a fresh treatment. One or two fast drivers can cause thousands of dollars damage by breaking the bond between the aggregate and the asphalt.

5. Use clean, dry aggregate for uniform cover. And take every care to employ equipment for loading, hauling and spreading which holds segregation to a minimum.

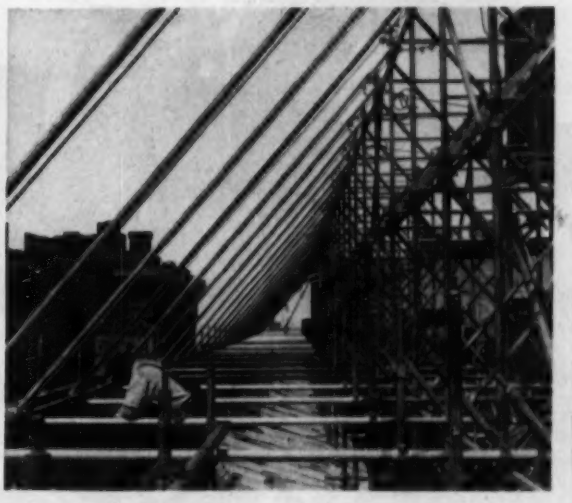
* * *

The second article in this series will appear in the October issue.

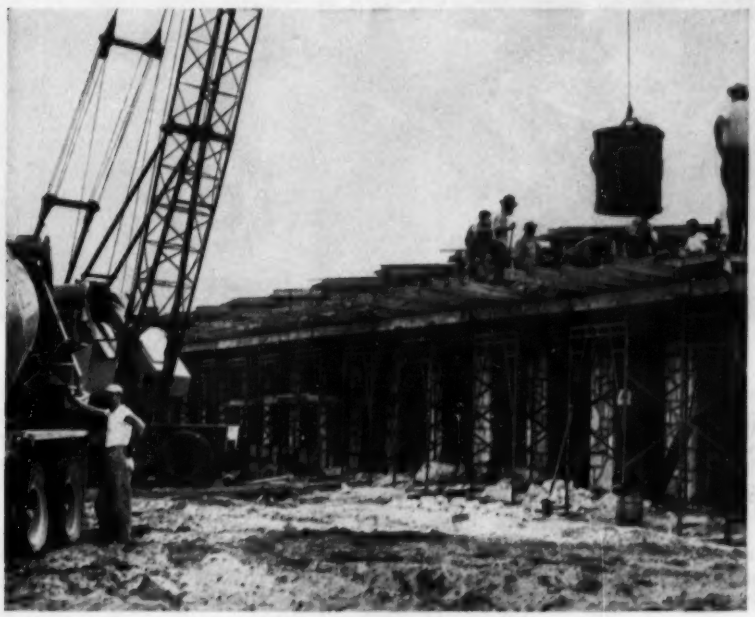
(Advertisement)

Scaffolding Methods . . . by Patent Scaffolding Co.

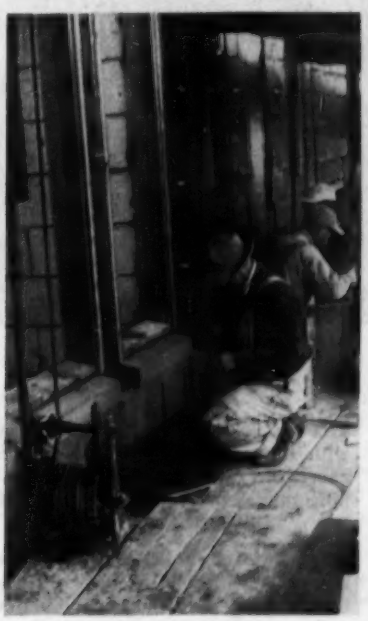
WITHIN EASY REACH—Separate 20"-wide platform, laid on sidewall brackets attached to "Trouble Saver"® Sectional Steel Scaffold, keeps materials easy to reach and men at most convenient working level. General contractor Damon G. Douglas uses this equipment for new elevator shaft at Hyatt Roller Bearing plant in Harrison, N. J.



OVER AND OUT—To remove cornice stones on an 18-story New York City building without disturbing a 6-ft. parapet wall, J. H. Taylor Construction Co. uses "TubeLox"® tube and coupler Scaffolding and cantilevered it 6 ft. beyond the wall. Steel cables, supporting a hanging, two-level "TubeLox" Scaffold below the cornice, run up over the framework and are anchored to the roof.



CONCRETE SHORING—Forms for the entire roof and all girders on the Northwest Dade Junior High School, Miami, are shored with 5'-wide "Trouble Saver" end frames, varying in height from 3' to 6'6". U-heads and extension legs in frame legs speed the installation of stringers. Thompson-Polizzi Construction Co., Miami, is the general contractor on this project. "Trouble Saver" Shoring, in addition to cutting shoring costs, provides a ready-made scaffold for stripping of forms or removing pans.



SEATTLE STONE—Four-story addition to the Bon Marche building in Seattle is faced with local cast stone by Bennett Campbell, Inc., general contractor. 88 6'6"-wide "Gold Medal"® Suspended Machines are used to scaffold two sides at a time.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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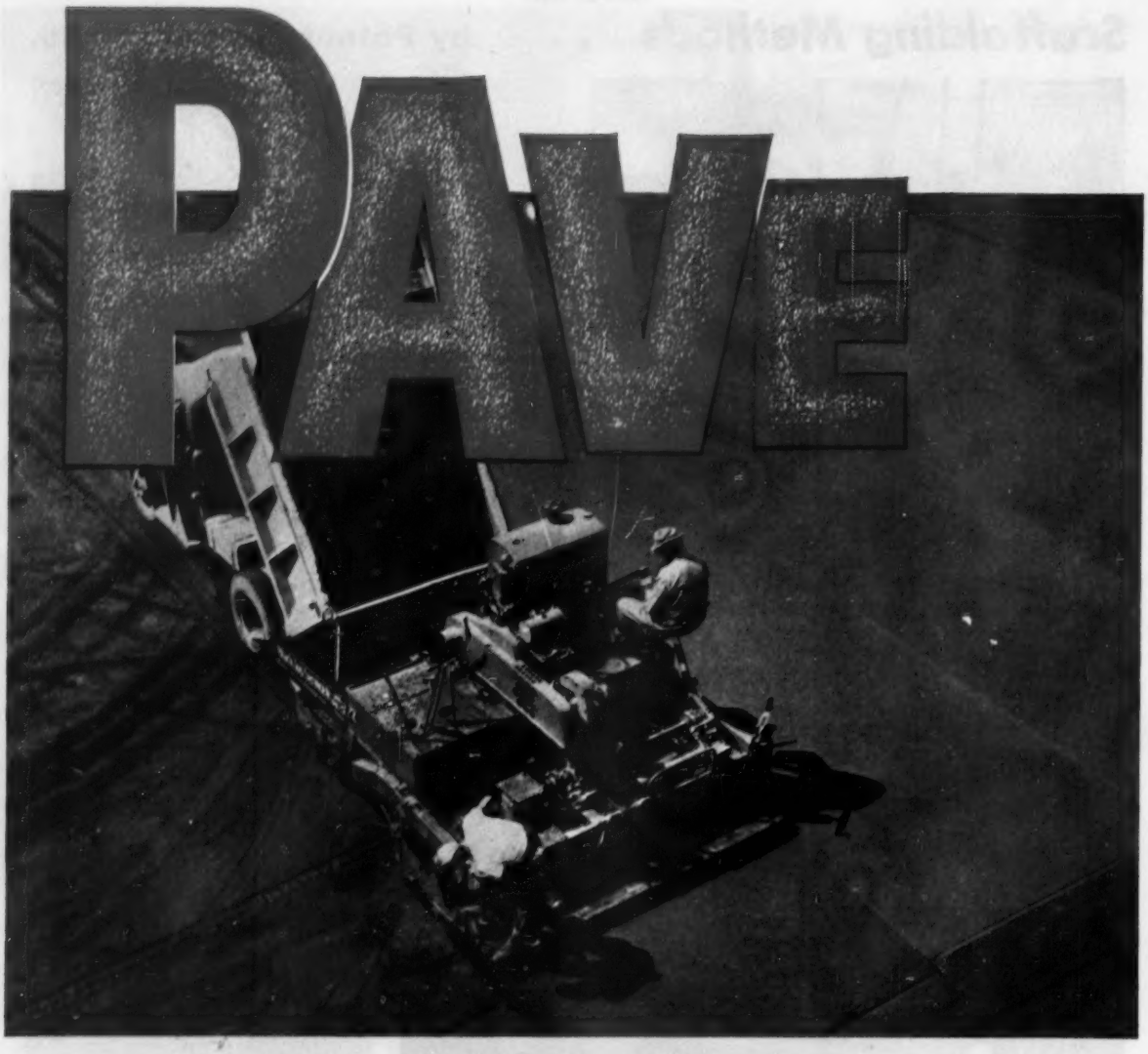

PAVE Profitably

PAVE with any bituminous mix—hot or cold—with the world's most widely accepted bituminous paver. No other machine or method will lay bituminous mix as quickly, perfectly or economically.

PAVE smooth riding surfaces, even over irregular bases. Automatic leveling increases or decreases the thickness of the mat to compensate for depressions or bumps in the existing surface.

PAVE with easier, reduced rolling. The tamper operates at 1200 strokes per min., compacts the mat as it's laid, assuring uniform density, a better bond between courses, and better joints between strips.

PAVE a crowned or wedge-shaped mat with quickly adjusted screed. Each side of the screed is independently controlled. Adjustments easily made while machine is in operation.

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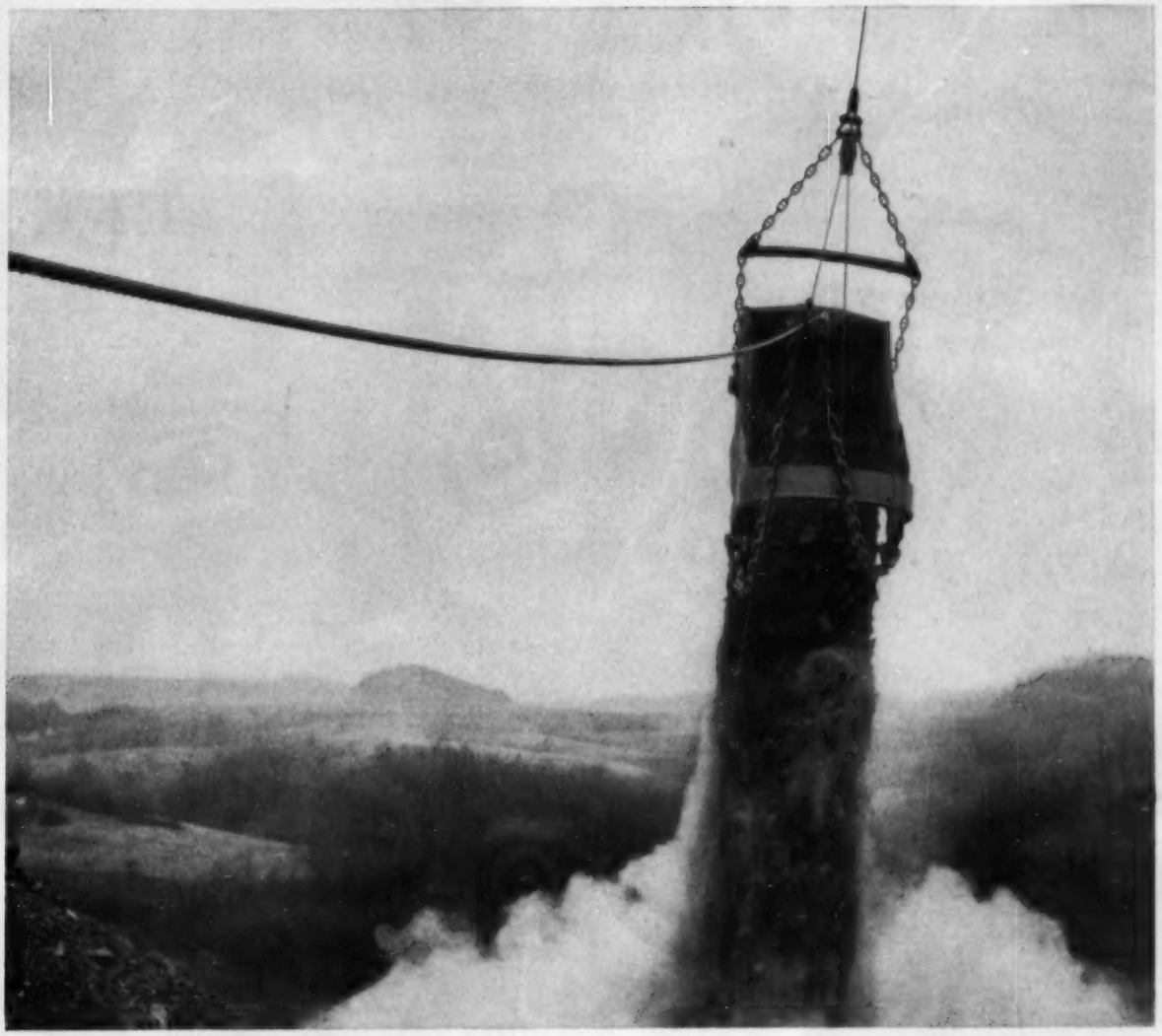

Here's where J & L Wire Rope cuts your costs

On the big rigs like this, wire rope is an important cost item. That's why so many big mining and construction men look to J&L for Wire Rope that fits their equipment requirements . . . for the right combination of strength, flexibility and toughness to stay on the job.

They've found the quality of J&L Wire Rope is reflected on the profit sheet in terms of minimum downtime for re-rigging, lower rope costs and more earth moved per wire rope dollar.

J&L Wire Rope quality is the combination of more than 100 years of steelmaking experience, topflight wire rope engineering and the most modern production equipment. The result—every wire, every strand, every J&L Wire Rope is "precisionbilt" for maximum service.

No matter what equipment you're operating there's a J&L Wire Rope designed to give you cost-cutting service life. Write today for complete information on J&L Wire Ropes.

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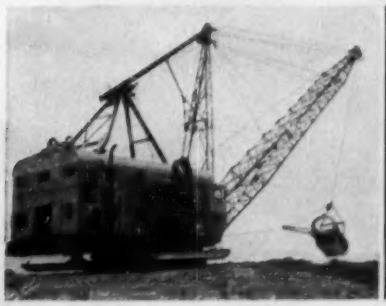

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Please send me complete information on J&L Wire Ropes.
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INSLEY
WORKING NEAR YOU
A
PROVEN
PERFORMER
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CONTRACTORS
Recognized as standard equipment by highway contractors for excavating and trenching—Insley's proven design characteristics give the contractor a dependable machine—simple to service, easy to maintain. Insley's rugged dependability means minimum down-time and more production hours.
The Insley Manufacturing Corporation of Indianapolis has been manufacturing construction equipment since 1907. The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted. Let your Insley distributor show you "an Insley at work."

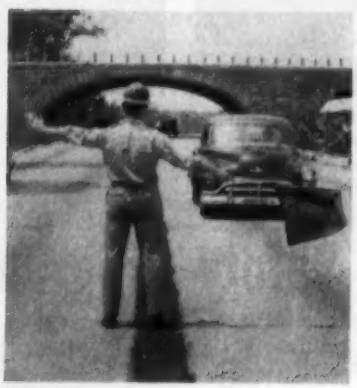
The Red Flag Rules the Road

• Traffic control at highway work sites often is very much a hit-or-miss affair. One difficulty is that there is no generally accepted standard way of handling the job. Now Hendrickson Bros., Inc., a Valley Stream, N. Y., general contractor, has published a code for its flagmen. The signals are easy to understand and should facilitate traffic movement. They also may help reduce traffic accidents. Hendrickson flagmen are told to stand on the shoulder of the road or in the barricaded lane and follow these simple rules:

1 RED FLAG should be standard (20x20) size, mounted on a sturdy staff. "Warning red" is the color to use. Do not substitute any other color.

2 TO SLOW TRAFFIC flagman should face oncoming vehicles and wave the flag in front of his body. His arm should not be raised above horizontal.

3 TO STOP TRAFFIC flagman should raise his free hand in the standard stop signal and extend the flag in a horizontal position across the lane of traffic.



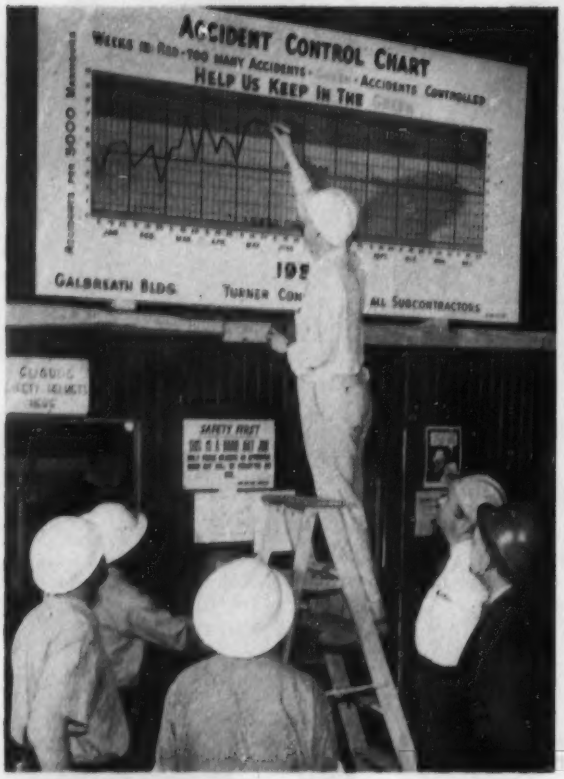
4 ON PARKWAYS flagman should stop lanes of traffic successively. He should stand where he can be seen easily and allow sufficient time for all traffic to stop.

5 TO SIGNAL PROCEED flagman should furl and lower the flag and give the signal with his free hand. He should never use the flag to signal proceed

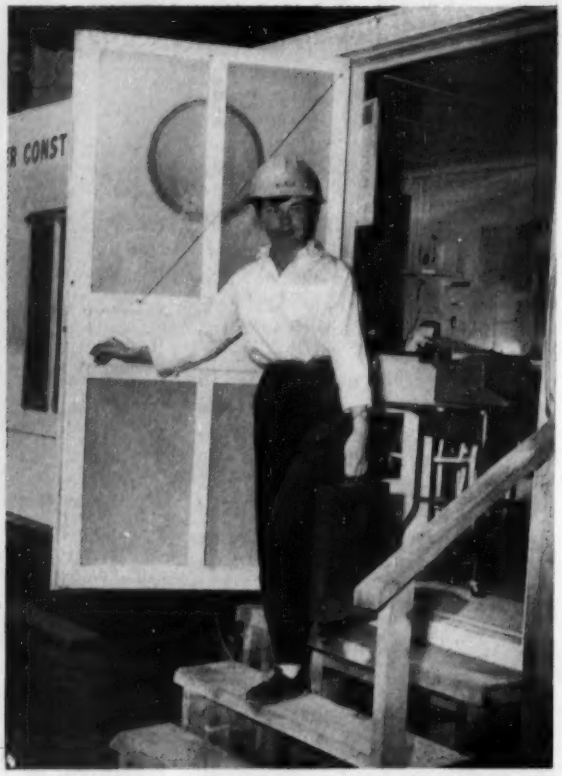
6 EMERGENCY VEHICLES must get the right-of-way promptly. To avoid confusing motorists, the flagman at all times must give his signals clearly and calmly.

7 WORKING IN PAIRS flagmen should communicate with each other by means of auxiliary signals. Each flagman should be alert to traffic in both directions.

8 RELIEF MAN must understand both the standard and the auxiliary signals. No flagman should ever leave his post unless authorized or replaced.



ACCIDENT CONTROL CHART is brought up to date as workmen on 45-story Socony-Mobil building watch. An important part of the safety program is to arouse and then maintain workers' interest.



JOB IS DANGEROUS because the site is surrounded by congested midtown New York streets. Two full-time nurses staff the on-the-job medical shack. Doctor is on the job several hrs each morning.

Top-to-Bottom Safety Program Gets Results

By FRANK E. BURKETT, Assistant Chief Engineer, Liberty-Mutual Insurance Co.

WHEN THEY BEGAN excavating for the Socony-Mobil building in the heart of New York City, someone remarked that it was like trying to dig a hole in your living room while a party is in progress.

From the day when Slattery Contracting Co. started moving 100,000 yd of earth and rock across pedestrian-jammed sidewalks and traffic-choked streets the Socony-Mobil project has posed a big problem in safety—both for passers-by and for the thousands of workers putting up the 45-story skyscraper.

As insurance carriers for the job, we estimated that with normal safety precautions Turner Construction Co, general contractors, could expect one accident per week for every 34 men employed. That would mean 1,500 accidents the first year. Actually, there were only 449 accidents the first year and 334 of that total were minor first aid cases.

A remarkable record—and it was no accident. Long before construction began, Turner executives got together with Liberty-Mutual engineers to work out an over-all safety program that could be integrated into every subcontractor's operations. Top-level concern over safety was reflected by M. Hershel Parsons, Turner's project executive: "Accident costs have become so important a part of production costs that their control is a policy-level matter," he said. "We just can't afford to say, 'Let Joe, the safety man, worry about it.'"

Since Liberty-Mutual carried the insurance for every contractor on the project, we had a head start because the program could be unified throughout the job and all our safety measures correlated for maximum effectiveness.

To carry out our program, a chain-of-command was established. A chart was distributed to show each man responsible for safety his duties in the over-all program at a glance.

Once we had drawn up plans outlining our program, Turner's next step was to send out a top-executive directive to all the subcontractors explaining the program as a whole. Each subcontractor also received letters and instructive materials to send out under his own letterhead to his job superintendents and foremen.

These letters pointed out that accident prevention would be considered just as much a part of the superintendents' and foremen's jobs as any of their other duties.

(Continued on page 106)

One of Rowe Construction's 50 pieces of heavy machinery

"Fifty Pieces of Heavy Machinery... No Sludge, No Carbon!"

Cat Motors Now Run 12,000 Hours Before Overhaul with Cities Service C-300 Motor Oil!

For the last 30 years, Delmar Rowe has been building roads. And for the last seven years, Cities Service Lubricants have paved his way to greater profits. The firm is Rowe Construction Co., Bloomington, Illinois...and since 1925, it has not only built countless roads, but has also reclaimed land, supplied gravel, and constructed sewers and water mains throughout the Bloomington area.

Rowe's choice of Cities Service Lubricants was no hit-or-miss proposition. "At that time," he says, "I'd had 23 years observing down-to-earth lubrication problems with construction machinery...and I was determined to find lubricants that gave the down-to-earth performance to solve these problems. Cities Service supplied the answer."

HOW RIGHT WAS ROWE? His Cat motors are a good example. They now run as long as 12,000 hours before overhaul using Cities Service C-300 Motor Oil. He reports: "There's no sludge or carbon problem and bearing life has been excellent. Other pieces of equipment show similar results. Obviously, we're saving on maintenance costs, and obviously it's showing up in the profit column."

Delmar Rowe is but one more construction man who's found Cities Service Lubrication the road to increased efficiency, lowered costs. Why not learn what it can do for you? Contact your nearest Cities Service representative or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

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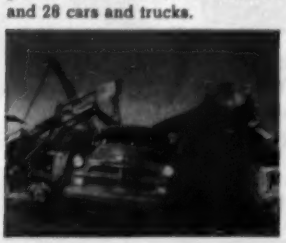
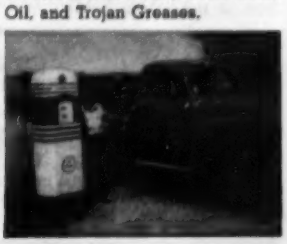
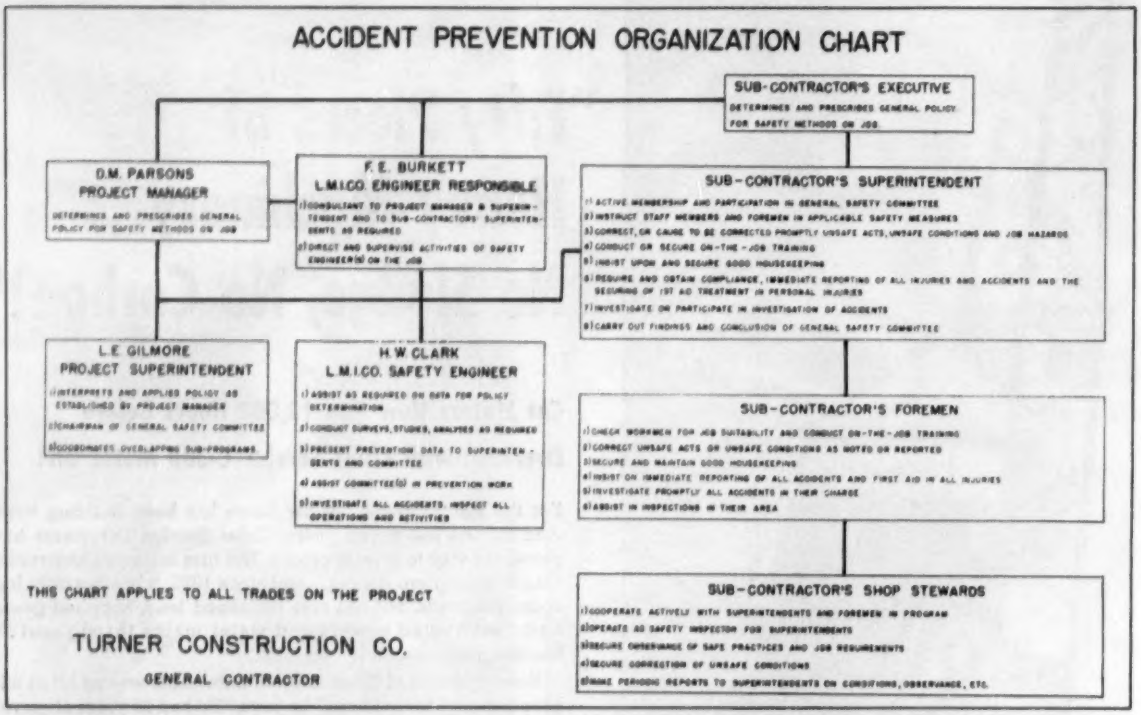
Tough Jobs for Tough Machines. Rowe has 50 pieces of heavy machinery constantly at work, including 8 drag line cranes, 2 crushing plants, 4 bulldozers, 5 end loaders and 26 cars and trucks.



One of Rowe's 19 Dump Trucks fills up with Cities Service Gasolene...a powerful treat for a hungry engine. Rowe also uses Cities Service Diesel Fuels, C-300 Motor Oil, and Trojan Greases.

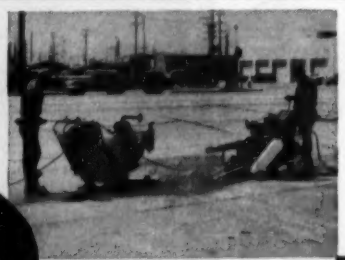



ACCIDENT PREVENTION ORGANIZATION CHART
SUB-CONTRACTOR'S EXECUTIVE
DETERMINES AND PRESCRIBES GENERAL POLICY FOR SAFETY METHODS ON JOB
D.M. PARSONS
PROJECT MANAGER
DETERMINES AND PRESCRIBES GENERAL POLICY FOR SAFETY METHODS ON JOB
F. E. BURKETT
L.M.I.CO. ENGINEER RESPONSIBLE
1) CONSULTANT TO PROJECT MANAGER & SUPERINTENDENT AND TO SUB-CONTRACTORS' SUPERINTENDENTS AS REQUIRED
2) DIRECT AND SUPERVISE ACTIVITIES OF SAFETY ENGINEER(S) ON THE JOB
SUB-CONTRACTOR'S SUPERINTENDENT
1) ACTIVE MEMBERSHIP AND PARTICIPATION IN GENERAL SAFETY COMMITTEE
2) INSTRUCT STAFF MEMBERS AND FOREMEN IN APPLICABLE SAFETY MEASURES
3) CORRECT, OR CAUSE TO BE CORRECTED PROMPTLY UNSAFE ACTS, UNSAFE CONDITIONS AND JOB HAZARDS
4) CONDUCT OR SECURE ON-THE-JOB TRAINING
5) INSIST UPON AND SECURE GOOD HOUSEKEEPING
6) REQUIRE AND OBTAIN COMPLIANCE, IMMEDIATE REPORTING OF ALL INJURIES AND ACCIDENTS AND THE SECURING OF 1ST AID TREATMENT IN PERSONAL INJURIES
7) INVESTIGATE OR PARTICIPATE IN INVESTIGATION OF ACCIDENTS
8) CARRY OUT FINDINGS AND CONCLUSION OF GENERAL SAFETY COMMITTEE
L.E. GILMORE
PROJECT SUPERINTENDENT
1) INTERPRETS AND APPLIES POLICY AS ESTABLISHED BY PROJECT MANAGER
2) CHAIRMAN OF GENERAL SAFETY COMMITTEE
3) COORDINATES OVERLAPPING SUB-PROGRAMS
H.W. CLARK
L.M.I.CO. SAFETY ENGINEER
1) ASSIST AS REQUIRED ON DATA FOR POLICY DETERMINATION
2) CONDUCT SURVEYS, STUDIES, ANALYSES AS REQUIRED
3) PRESENT PREVENTION DATA TO SUPERINTENDENTS AND COMMITTEE
4) ASSIST COMMITTEE(S) IN PREVENTION WORK
5) INVESTIGATE ALL ACCIDENTS, INSPECT ALL OPERATIONS AND ACTIVITIES
SUB-CONTRACTOR'S FOREMEN
1) CHECK WORKMEN FOR JOB SUITABILITY AND CONDUCT ON-THE-JOB TRAINING
2) CORRECT UNSAFE ACTS OR UNSAFE CONDITIONS AS NOTED OR REPORTED
3) SECURE AND MAINTAIN GOOD HOUSEKEEPING
4) INSIST ON IMMEDIATE REPORTING OF ALL ACCIDENTS AND FIRST AID IN ALL INJURIES
5) INVESTIGATE PROMPTLY ALL ACCIDENTS IN THEIR CHARGE
6) ASSIST IN INSPECTIONS IN THEIR AREA
SUB-CONTRACTOR'S SHOP STEWARDS
1) COOPERATE ACTIVELY WITH SUPERINTENDENTS AND FOREMEN IN PROGRAM
2) OPERATE AS SAFETY INSPECTOR FOR SUPERINTENDENTS
3) SECURE OBSERVANCE OF SAFE PRACTICES AND JOB REQUIREMENTS
4) SECURE CORRECTION OF UNSAFE CONDITIONS
5) MAKE PERIODIC REPORTS TO SUPERINTENDENTS ON CONDITIONS, OBSERVANCE, ETC.
THIS CHART APPLIES TO ALL TRADES ON THE PROJECT
TURNER CONSTRUCTION CO.
GENERAL CONTRACTOR

CHAIN OF COMMAND is outlined in a chart distributed to men responsible for the safety program. A Liberty-Mutual safety engineer is on hand full time as advisor to the safety committee. He also posts conspicuous safety signs, investigates accidents.

There's MORE NEW than the streamlining on the

ROCK it back... TILT it forward



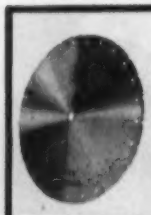
AMAZING BALANCE on front or rear wheels alone gives you *a new degree of maneuverability!*

No other heavy-duty concrete cutter can compare with the new Felker Model 254! See what *maneuverability* is really like! Quickly gets into and *out of* the tight spots, does all jobs without mankilling effort, turns in its own length! See how Blade-Saver Collars stretch out blade life! Try the "254" today... Ask for demonstration from your nearest Felker distributor!

NEW FOLDER GIVES DATA — Before buying any concrete cutter get these facts! They'll convince you here's the *best* buy in the whole field!

FELKER *Model 254* CONCRETE CUTTER

- 25 H.P. WISCONSIN!
- NEW "BLADE-SAVER" COLLARS! Pat. App. For. Trademark Reg.
- SELF-PROPELLING DRIVE!
- HYDRAULIC BLADE ACTUATION!
- CUTS TO 6¾" DEEP!
- BUILT-IN COOLANT PUMP! Many other features!



Felker Di-Met SEGMENTED TYPE BLADES

Preferred for maximum footage at lowest cost-per-cut. Wide range of bond variations for maximum life under every condition! Ask also about the new Felker Abrasive Blades for cutting green concrete, where applicable.

FELKER DI-MET SINCE 1930

FELKER MANUFACTURING CO.
TORRANCE * CALIFORNIA

World's Largest and Oldest Manufacturer of Diamond Abrasive Cut-Off Wheels and Machines

The staff was to be held responsible for accident costs just the same as for any other production cost.

In this manner, every man on the job was made aware that safety measures and practices had the backing and surveillance of every contractor on the job, his own included, and that cooperation and results were expected.

After construction started, we distributed an accident-control chart, copies of which were posted in the offices of each of the project managers. We believe it has kept management safety conscious. We also have used the chart in a rather unusual way to arouse worker interest.

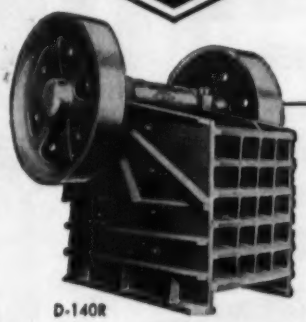
SAFETY SLOGANS, posted around the job, indicate to workers that management considers safe operations an important part of their job. Medical shack is in background.

Over the guard house at the main entrance to the project we erected a colorful 4x8-ft reproduction of the chart. Every Tuesday morning the accident record for the preceding week is plotted on this board. While we have no way of knowing just how effective this device is, we do know that the workers have taken a keen interest in the chart, gathering around it each Tuesday to see just where the accident curve is going. We think the sign serves as a vivid reminder that accidents do happen and that management means business when it talks about accident control.

About every four or five weeks, the General Safety Committee, with L. E. Gilmore, Turner's project superintendent as chairman, holds a meeting to discuss new

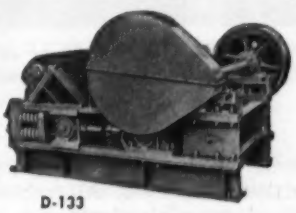
DIAMOND

Serves Every Aggregate Producing Need


D-140R

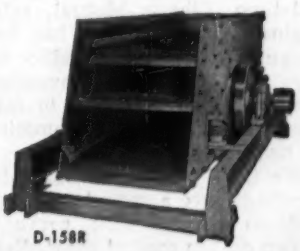
JAW CRUSHERS

Aggregate producing ability, strength and economical maintenance are included in Diamond's exclusive design. Its long, deep jaws and flat crushing angle handles the hardest rock with minimum effort. Jaws are manganese steel and reversible for extra service life. 11 sizes. Capacities 1½ to 500 tons per hour. CATALOG 600


D-133

ROLL CRUSHERS

A perfect finishing crusher, equipped with special bearings and drive arrangement to relieve stresses. Features floating roll and safety spring releases. Six sizes. Capacities 10 to 200 tons per hour. Chain or Star Gear Drive. CATALOG D-5413


D-158R

VIBRATING SCREENS

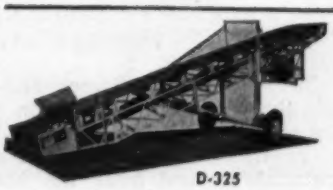
Scalping and Scrubbing Screens Drag Washers

A Diamond balanced vibrator cannot be choked. There is generous room between decks. The vibrating action is evenly distributed to every part of the screening area. Fast, easy flow of material with a thorough separation job is normal performance for Diamond screens. Ask for Catalog D-5412, which also describes Scalping and Scrubbing Screens as well as Drag Washers.

D-155

FEEDERS, BINS, HOPPERS

Apron and Plate Feeders, Grizzlies, Storage Bins—a complete line and range of sizes are described in CATALOG D-101


D-325

CONVEYORS

Sectional Steel Conveyors—three featured styles. Bucket elevators, Conveyor Rolls, Belt Conveyors. Stationary conveyor systems built and installed to suit every requirement and condition of service. All described in CATALOG D-5416.

There's no cost or obligation for these informative catalogs. Send today for the ones that will be helpful to you. And if you want additional data, ask the Diamond distributor in your district.

DIAMOND IRON WORKS

DIVISION **GOODMAN** MANUFACTURING COMPANY

HALSTED STREET AND 48th PLACE • CHICAGO 9, ILLINOIS

Rock, Sand and Gravel Crushing, Screening, Washing and Conveying Equipment—Portable and Stationary Plants

Here are important facts for the "man behind the gun"

This White 18" Dumpy level has

...more of the features you want, yet costs you less!

Before you buy, compare this White Dumpy level with a similar model of any other recognized make. From every standpoint — design detail . . . quality construction . . . work-speeding, life-lengthening features and cost — you'll quickly see why a White's the best buy you can make. It will make your work faster, easier, more accurate. Check this comparison chart:

FEATURES	D. White No. 7080	Instrument A	Instrument B
Magnifying power of telescope	35X	30X	27X
Distance away you can read 1/100 ft. graduation	1200 ft.	1050 ft.	900 ft.
Diameter of objective lens	1.81 in.	1.485 in.	1.69 in.
Field of view (in minutes of arc)	64'	52'	60'
Coated optics	YES	YES	YES
Covered leveling screws	YES	YES	YES
Can you easily replace worn leveling screws in the field?	YES	NO	YES
Sensitivity of level vial (in seconds of arc per 2mm of graduation)	20"	20"	25"
Price — complete with carrying case, tripod and accessories — F.O.B. factory	$295.00*	higher	higher

For complete details on the 18-in. Dumpy level and other equally fine engineering instruments, see your David White dealer, or write direct to David White Co., 359 W. Court Street, Milwaukee 12, Wisconsin.

DAVID WHITE COMPANY

We offer complete, expert repair service on all makes, all types of instruments.

*Price subject to change without notice.

PREFABRICATED GUARD RAILS go up around elevator and pipe shafts as soon as the floor is stripped. Filler strips are placed in the steel stair treads as another precaution.

hazards which may arise as construction progresses. All subcontractors' superintendents are active members of this committee. A full-time Liberty-Mutual safety engineer, H. W. Clark, has been assigned to the job to conduct surveys and studies, to investigate accidents, and to report to management and the safety committee at its meetings.

We have found that our safety meetings have a very dramatic effect on the accident curve, as shown on the control chart. Every time a safety meeting is held, the accident curve had leveled off or dropped abruptly for the next few weeks.

Of course, any worth-while safety program must be based on the premise that an accident can be prevented only by removing or controlling the cause of the accident. This means that possible accidents must be anticipated and dealt with in the planning stage of operations.

In the case of the Socony-Mobil job, the very size and location of the project posed immediate safety problems in the movement of materials to and from the site. After consulting with Turner management, we made a thorough study of overlapping work and traffic areas, including the movement of pedestrians and traffic around the job site.

From this study we drew up a detailed diagram of the whole first floor working area showing the congestion at various entrances and the possible exposure to pedestrians passing by the site. The diagram has proved an extremely useful tool. It gives management a guide to plan the safest and most efficient handling of incoming and outgoing materials. A similar chart proved useful for Slattery during excavation when the removal of earth and rock from the site required almost constant use of the same areas by workmen, trucks, pedestrians and New York traffic.

These hazard-evaluation charts give the contractor a sneak preview of accident causes and let him take out the dangerous kinks before it is too late. They also provide the safety engineer with an over-all location map of hazardous areas to watch and control. Our low accident record indicates they have paid off.

In line with the hazard-evaluation studies, we also made a number of structural tests on the job. For example, a check was made on the stability of the sheet piling, floor slab forms, and foundation wall forms.

We know that a good accident record is not just the result of safe procedures and protective devices. It also depends upon the safety consciousness of the worker himself, and this in turn depends a good deal upon the atmosphere and attitudes he finds around him. Part of this atmosphere, as we have mentioned, is made up of management's interest in the safe-

(Continued on page 112)

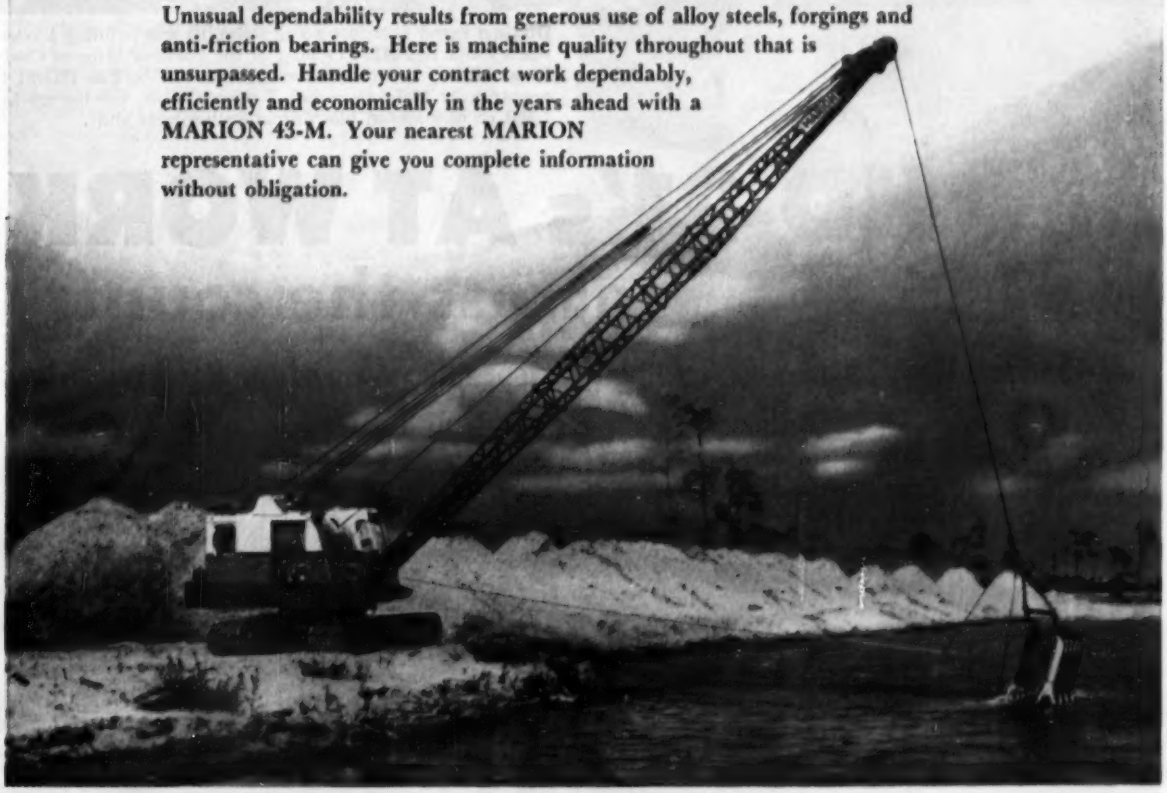
a good right arm for contractors

MARION 43-M

● The muscle, brawn and speed of the MARION 43-M give you a big production machine, as a 1 cubic yard shovel — as a 1 or 1¼ cubic yard dragline—as a crane with a 20 ton rating—as a 1 cubic yard backhoe—or as a pile driver with boom lengths up to 80 feet.

The 43-M travels easily on a carryall, and is readily convertible from shovel to crane work. MARION Air Control helps make it a fast worker, easily controlled without operator fatigue.

Unusual dependability results from generous use of alloy steels, forgings and anti-friction bearings. Here is machine quality throughout that is unsurpassed. Handle your contract work dependably, efficiently and economically in the years ahead with a MARION 43-M. Your nearest MARION representative can give you complete information without obligation.



MARION / MARION POWER SHOVEL COMPANY
MARION, OHIO, U. S. A.

A Subsidiary of Merritt-Chapman & Scott Corporation

POWER SHOVELS FROM ½ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES

DRAGLINES • CLAMSHELLS • LOG LOADERS
CRANES, CRAWLER & RUBBER MOUNTED • BACKHOES

Your Confidence Is Justified *Where This Flag Flies*

Dozing hard sandstone in stripping and building access roads keeps two HD-21's busy at the Peerless Mine of Coal River Mining Company, Hookersville, W. Va. The HD-21's are working 16 hours a day, 7 days a week, moving up to 1,500 yd of material like this in each 8-hour shift.

new HD-21's AT WORK across the country

Allis-Chalmers HD-21's are meeting today's stepped-up demands on hundreds of jobs

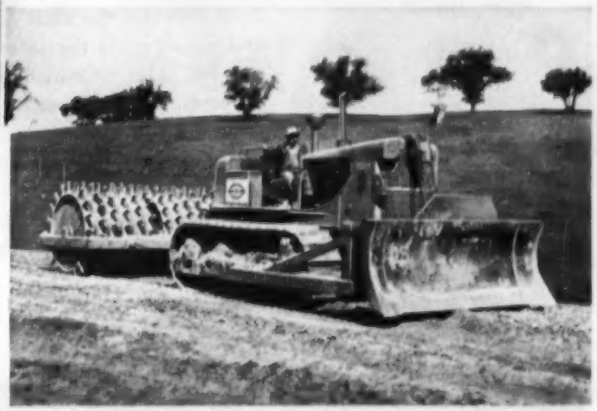
Excavating and leveling land for an outdoor theater near Milwaukee was the first assignment for this HD-21. Kramp Construction Company was the first Wisconsin owner of one of these productive new tractors.

Push-loading scrapers is another of many uses for the HD-21. The torque converter drive automatically selects the speed and power necessary to help scrapers pick up a full load. Contractors Machinery Company, subsidiary of Grannis and Sloan, Fayetteville, N. C., is using this HD-21 for extending aircraft runways at Pope Field, Ft. Bragg, N. C.

Clearing, dozing and cleaning up around a 3-yd shovel . . . that's how Badget Mine Stripping Company uses its two HD-21 Allis-Chalmers Tractors. The units are working on the northeast extension to the Pennsylvania Turnpike in the Pocono Section near Wilkes-Barre, Pa.

New Allis-Chalmers tractors with advanced basic design features, job-proved during millions of operating hours, are going to work in your neighborhood. Ask your Allis-Chalmers dealer where you can see them in action.

Big dirt mover on the new Kenwood Plaza Shopping Center, Kenwood, Ohio (Cincinnati suburb), is this 44,000-lb HD-21. The contractor, John R. Jurgensen Company, will move an estimated 250,000 yd before the job is finished.



Pulling, pushing and dozing, two HD-21's owned by Ransome Company, Emeryville, Calif., are busy on the 4.4-mile, all-new Ygnacio Valley Road extension job in Contra Costa County, Calif.

Big jobs need big equipment and some of the biggest producers on the Indiana Turnpike are the many HD-21 tractors at work there. Here one of the 204-hp giants pulls a loader on a stretch for which Rieth-Riley Construction Co., Inc. is the prime contractor and Chapin & Chapin, Inc. the sub-contractor.

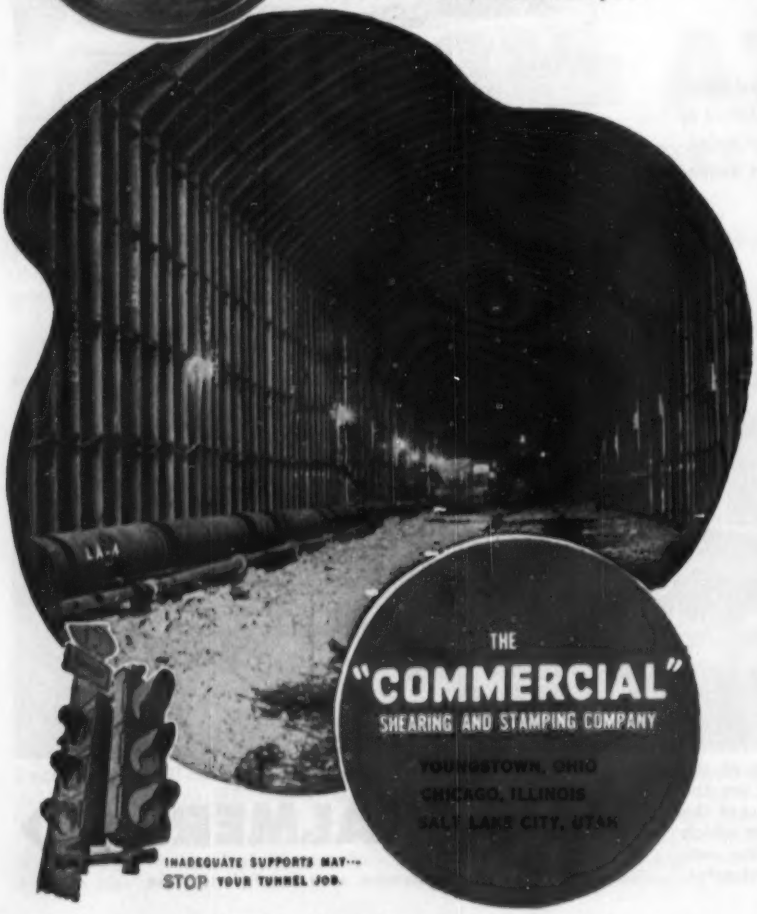
ALLIS-CHALMERS

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

HOLE THRU FASTER
WITH "COMMERCIAL"
STEEL TUNNEL SUPPORTS

Full face headings in many hard ground tunnels can only be maintained when tunnel supports can be set quickly after the mucking operation. "Commercial" steel supports are completely fabricated and as they go into the tunnel portal you may be sure that they will fit, will erect into place quickly and only need field bolting by less skilled labor.

Steel provides the most economical and by all odds the safest ground support. Use "Commercial" steel supports, designed and produced by men who have had the greatest experience, are recognized specialists and whose product was used with such outstanding results in tunnels on the Pennsylvania Turnpike.



SAFETY PROGRAM PAYS OFF . . .
Continued from page 108

ty program, part by the adequacy of good housekeeping, part by the competency of the medical facilities and part by the signs and bulletins posted around the job.

It also depends upon simple protective devices. The hard hat is a good illustration. All over the project we have emblazoned the words: "This is a hard-hat job." This is not just a company recommendation, but strict company policy.

We are convinced that the hard

WIDE SCAFFOLDING with safety bars, hard hats and guard rails (left) are just a few of the safety devices that are standard equipment on Socony-Mobil building.

hat is now considered more than just a safety device. It has become a symbol of management concern in the safety program, and this workers recognize.

Another useful protective device is the prefabricated guard rails Turner erected around each elevator and pipe shaft as soon as the floor forms were stripped. Plywood sheets also were used to cover all elevator doors as soon as the bucks were installed. We also placed wood filler strips in all steel stair treads.

Another effective part of the Socony-Mobil safety program is the on-the-job medical trailer and shack attached to it. Like hard hats and prefabricated guard rails, we believe the medical trailer serves a dual purpose. First, we

(Continued on page 194)

Nearly 200 "EUCS" already at work on the

Model 63TD "Euc" getting a heaped load of 20 cu. yds. at site of Long Sault Dam near Massena, N. Y.

Although work on the St. Lawrence Seaway and related New York Power Authority projects is just getting under way, close to 200 Euclids are already "digging in". They're helping build cofferdams, making diversion cuts, relocating highways and railroads, and preparing power house sites. Other "Eucs" are doing similar jobs on the Canadian side of the river.

One of the key projects in the whole Seaway program is construction of Long Sault Dam near Massena, N. Y., a joint venture sponsored by Walsh Construction Co. Others who have pooled their men and machines on this 7 million yard job are B. Perini & Sons Co., Morrison-Knudsen Co., Peter Kiewit Sons Co. and Utah Construction Co. . . . some of America's leading contractors. At present 50 "Eucs" are working on this one contract and others will be added as work progresses.

Eight of the Euclids are 22-ton Rear-Dumps with 300 h.p. engines and Torqmatic Drives. They were selected for this job because of their ability to haul big loads at fast travel speeds day in and day out . . . with less down time for servicing and repairs. That's the kind of performance that has made "Eucs" the preferred equipment for hauling heavy excavation on the toughest jobs everywhere . . . it's one of the important reasons why ***EUCLIDS are your best investment.***

Torqmatic Drive and 300 h.p. make this "Euc" a top performer. Torque Converter and semi-automatic transmission eliminate manual shifting—utilize full engine power at all times.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

EUCLID

GM GENERAL MOTORS

BOOST DIESEL OUTPUT

with less fuel...less noise...less smoke

AiResearch Turbochargers give your stationary or mobile diesels more added horsepower than any comparable turbocharger or supercharger installation!

The application of AiResearch Turbochargers to stationary diesel equipment will overcome excessive noise and smoke problems... jump horsepower to a much higher level... and cut your fuel bills on a horsepower per hour basis.

In addition, it will restore operating efficiency for your diesel power plants at altitude.

Application of these finely engineered power packages to mobile diesel equipment is equally effective... as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability. Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

TWO-WAY RADIO is an effective aid in maintenance problems. With it the serviceman can "call in" regardless of his location in the field. Loudspeakers, such as the one mounted on this pick-up, enable him to be on call, yet continue his work.

Take to the Air Waves . . .

LOUDSPEAKERS CAN BE MOUNTED almost anywhere on field equipment. This one is attached to the right-hand fender of a John Deere tractor and aimed directly at the operator.

A Shortcut on Maintenance

"AN ALL-DAY CONFERENCE less the penalty of personnel being at a given spot at a prearranged time." That seems to be the big advantage of two-way radio, according to a survey CM&E recently conducted among a number of contractors. With radio, less time is consumed in getting in touch with cars, equipment and outlying installations. From a maintenance angle, two-way radio is invaluable. Reports can be obtained by the home office at any time. Men on the job can get last minute instructions from the office. Management and supervisory personnel can eliminate guess-work in production. And in case of serious trouble, assistance can be usually provided before the situation becomes hopeless. In case of accidents, it's a lifesaver.

There are a number of reputable manufacturers of two-way radio, but the big three are General Electric, RCA and Motorola. *(Continued on page 118)*

ELECTRIC POWER

DELCO-REMY A.C. GENERATORS FOR EXTRA-HEAVY ELECTRICAL LOADS

Delco-Remy's new 6- and 12-volt A.C.-D.C. charging systems are the answer to the *extra-heavy* electrical demands of late-model contractors' trucks, cars, and other vehicles equipped with two-way radio, floodlights, or other special electrical units. High wattage output is ample for heaviest electrical loads . . . generators pick up discharged batteries quickly in emergencies. Delco-Remy A.C.-D.C. charging systems are unexcelled at engine-idle . . . furnish up to 180 amperes at higher engine speeds . . . are dependable under the most rugged operating conditions at all engine speeds.

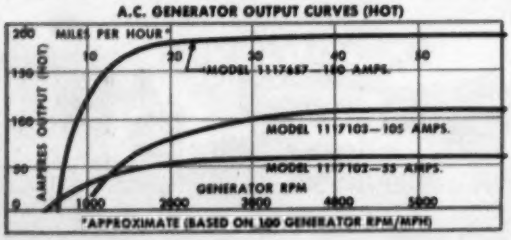
Application packages, for both 6- and 12-volt generators, complete with installation instruction sheets for popular makes of cars and trucks, are available. Conversion is simple. See your nearest United Motors distributor for additional data.

A.C. GENERATOR PERFORMANCE DATA (HOT)

Model	Volts	Cut-in RPM	Engine Idle Amperes*	Maximum Amperes	Power Watts SAE	Recommended For
1117102	12	525	39	55	825	All speeds.
1117103	12	960	5	105	1575	All speeds.
1117657	12	550	130	180	2700	All speeds.
1117062-3-4	6	750	38	90	720	All speeds.

*APPROXIMATE (BASED ON 1000 GENERATOR RPM)

A.C. GENERATOR OUTPUT CURVES (HOT)



*APPROXIMATE (BASED ON 100 GENERATOR RPM/MPH)

DELCO-REMY D.C. GENERATORS FOR MEDIUM-TO-HEAVY ELECTRICAL LOADS

Delco-Remy's 12-volt extra-output D.C. generators are an economical answer to the electrical needs of late-model contractors' trucks, cars . . . other vehicles with additional lights, two-way radios, or other special electrical equipment in medium- to heavy-duty service. Delco-Remy extra-output D.C. generators are low in cost, simple to install, economical to maintain. Performance data on Delco-Remy extra-output D.C. generators are shown at the right.

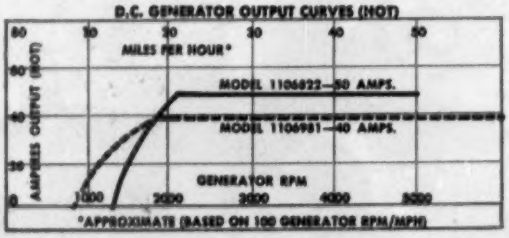
For further details and application data, see your nearest United Motors distributor.

D.C. GENERATOR PERFORMANCE DATA (HOT)

Model	Volts	Cut-in RPM	Curb Idle Amperes*	Maximum Amperes	Power Watts SAE	Recommended For
1106822	12	1300	0	50	750	Low to Medium Speeds
1106981	12	825	14	40	600	Low speeds & idling.
1106757	6	820	†	55	440	Medium to high speeds.
1106758	6	560	26	45	360	Medium Speeds and Idling
1106977	6	610	28	55	440	Low speeds & idling.

*APPROXIMATE (BASED ON 1000 GENERATOR RPM)

D.C. GENERATOR OUTPUT CURVES (HOT)



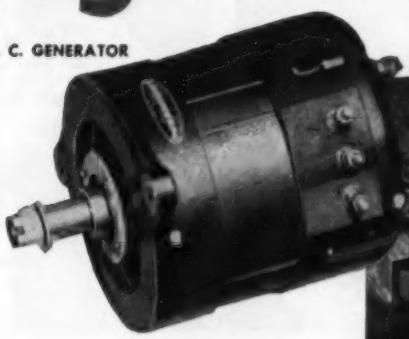
*APPROXIMATE (BASED ON 100 GENERATOR RPM/MPH)

Delco-Remy
ELECTRICAL SYSTEMS

DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

right for the job

A. C. GENERATOR



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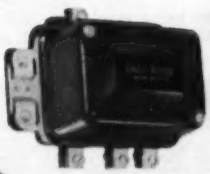

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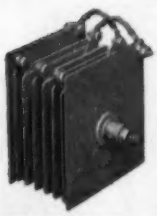
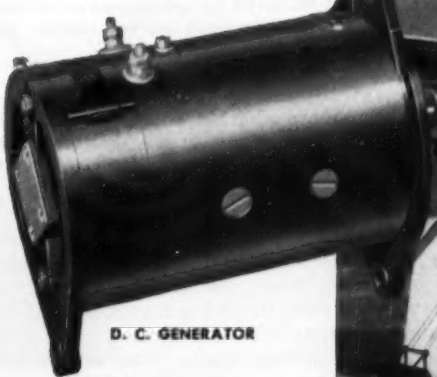
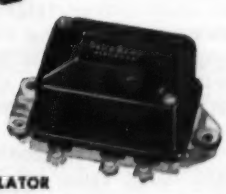


D. C. GENERATOR



REGULATOR



A GENERAL MOTORS PRODUCT

A UNITED MOTORS LINE

DISTRIBUTED BY WHOLESALERS EVERYWHERE

RADIO CAN GO where equipment can't. This small hand portable can be carried over the shoulder. It has a range of 10 mi.

J. B. KELLEY, in addition to being shop foreman for Noonan Construction Co., Pensacola, Fla., serves as radio dispatcher.

AN EXTRA BATTERY and generator can be used in field units for improved performance. Note handy spot for portable speaker.

THE TRANSMITTER AND RECEIVER for two-way radios are compact and shock-proofed. Most are moisture and dust resistant, too.

Prices for equipment and installation are generally competitive. Just how much will it cost you to install a radio communication system? It all depends on the power of your transmitter and the number of mobile units you use.

Your base station will cost you anywhere from $750 to $2,500. The mobile units for your equipment will cost around $550 each installed. If you use a telephone or telegraph line set-up, the remote control station will set you back about $200. If needed, the two transmitter-receiver units that connect the office and base station by radio relay are to be had for $600 to $1,800 each. Antenna installations will run anywhere from $100 to $1,000.

If you don't want to buy the radio system outright, most major manufacturers have a lease arrangement. Generally, however, it is considered more satisfactory to buy the equipment outright. When you do, you can figure on a life of 7 to 10 yr, with proper maintenance.

All manufacturers make arrangements for the proper maintenance of radio equipment on a flat fee basis per month.

You can use the radio system within a range of a few hundred feet up to 120 mi, depending on the equipment you buy and the terrain in which it is used.

After you buy a radio system, allow three months to get your frequency assigned to you by the Federal Communication Commission. But make sure before you buy that such a frequency *can* be assigned to you. If you operate in or near a large metropolitan area, you might have trouble getting one.

The most popular power for two-way radio seems to be a 60-w transmitter. Mobile units can be operated from either a 6- or 12-v system. Usually it is better to add an additional generator and battery to the mobile unit or install a higher output generator.

It is not necessary when in the field to remain in the car in order to hear the radio-telephone or radio. Some are rigged so that the horn will automatically blow when someone wants you, and others have an additional portable speaker with extension wiring that can be clamped on the side of the mobile unit so that you can aim the speaker in the direction you plan to be.

But let's hear from contractors who are using radio equipment. How do they evaluate the use of two-way radio?

"For a $7,000 investment, which is what it costs us for equipment and installation charges, our General Electric two-way radio system is one of the best investments,

NEW JERSEY
PENNSYLVANIA
MAINE
OKLAHOMA
WEST VIRGINIA
NEW YORK
KENTUCKY
NEW HAMPSHIRE
OHIO

NOW INDIANA

PETER KIEWIT SONS CO. uses a 22½-ton Lorain Moto-Crane, model MC-424, with 50-ft. boom, handling concrete bucket on railroad overpass construction on $5-million contract C-6 east of Gary. This Omaha, Nebraska, contractor has purchased 44 Lorains.

TAYLOR WHELESS & CO. of Jackson, Mississippi (joint contractors with Winston Bros.) use a 20-ton Lorain Moto-Crane as a dragline to excavate footings for an overpass on contracts C-17, 18, 19 ($7,500,000) near La Porte, Indiana. Also used to handle concrete, forms, steel and clamshell excavation.

ANOTHER TURNPIKE
MORE LORAINS... *MORE* PROOF!

Ever since the first yard of earth was moved on America's first super-highways, Lorains have been a familiar sight . . . from the Pennsylvania Turnpike to the current Indiana Turnpike. Hundreds of Lorains have seen duty on these closely bid, tightly scheduled contracts. Contractors' names through these years on these jobs are the "Who's Who in American Construction."

Now, the 156-mile, $280-million Indiana Turnpike is the latest of these "proving grounds" for Lorains as they help dig the 50,200,000 yds. of material, help pour the 300,000 yds. of concrete on the 260 structures, help place the 86,000 tons of steel.

Shovel-crane equipment, particularly on vast projects like this, must fit many kinds of work — digging, casting, erection, material handling, to mention a few. Lorains do that best of all because of the tremendous selection of shovel-crane sizes through 2½-yard shovels and up to 61-ton crane capacities . . . plus the convertibility to all front ends . . . plus many types and sizes of rubber-tire and crawler mountings available for any terrain or travel conditions.

Many years and many turnpikes are your proof that Lorains will lick rough, tough, fast-scheduled jobs . . . and prove they'll *move more material, faster, cheaper, on your job, too!*

THE THEW SHOVEL CO., LORAIN, OHIO

(1) This 1½-yd. Lorain dragline uses a 60-ft. boom to dig drainage ditches 6 feet deep, 28 feet wide, at the rate of 250-ft. per day on the Carlson-Fleming subcontract near Rolling Prairie, Indiana.

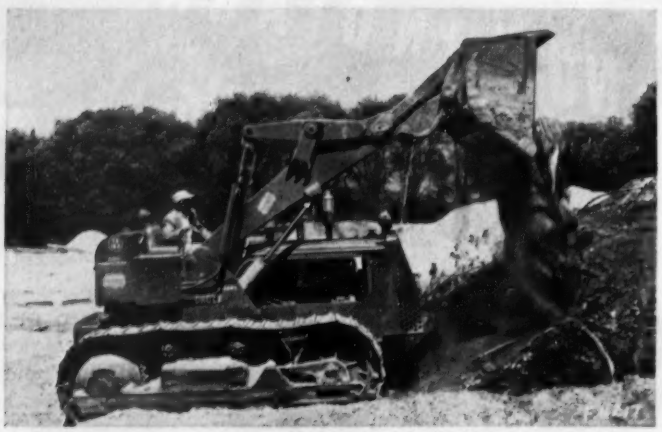
(2) Winston Bros. of Minneapolis (joint contractors with Taylor Wheless & Co.), an 8-time Lorain owner, use a 25-ton Lorain Moto-Crane to handle 1¼-yd. concrete buckets to pour box culverts, handling about 30 loads per hour. This Moto-Crane is assigned to many other varied duties all over the job.

(3) This Lorain 30-ton Moto-Crane, model MC-524, with an 80-ft. boom pours concrete for an overpass on the S. J. Groves & Sons Co. contract near La Grange, covering 12 miles and totalling $6,740,000.

THEW **LORAIN**

Tractor-wise Owners and Operators ...in New International

"IT CAN SELF-LOAD AND DELIVER FASTEST"—"International TD-18A improvements like the new 300% stronger track frames and cartridge-type track roller seals increase production, machine life, and operating ease. As for power, our new TD-18A can self-load the 8-11 cubic yard scraper and deliver fastest of any crawler we ever had." *Here's proof extra traction matches the TD-18A's power increase!* G. W. Owen, Warden, Henry County Public Works, McDonough, Georgia.



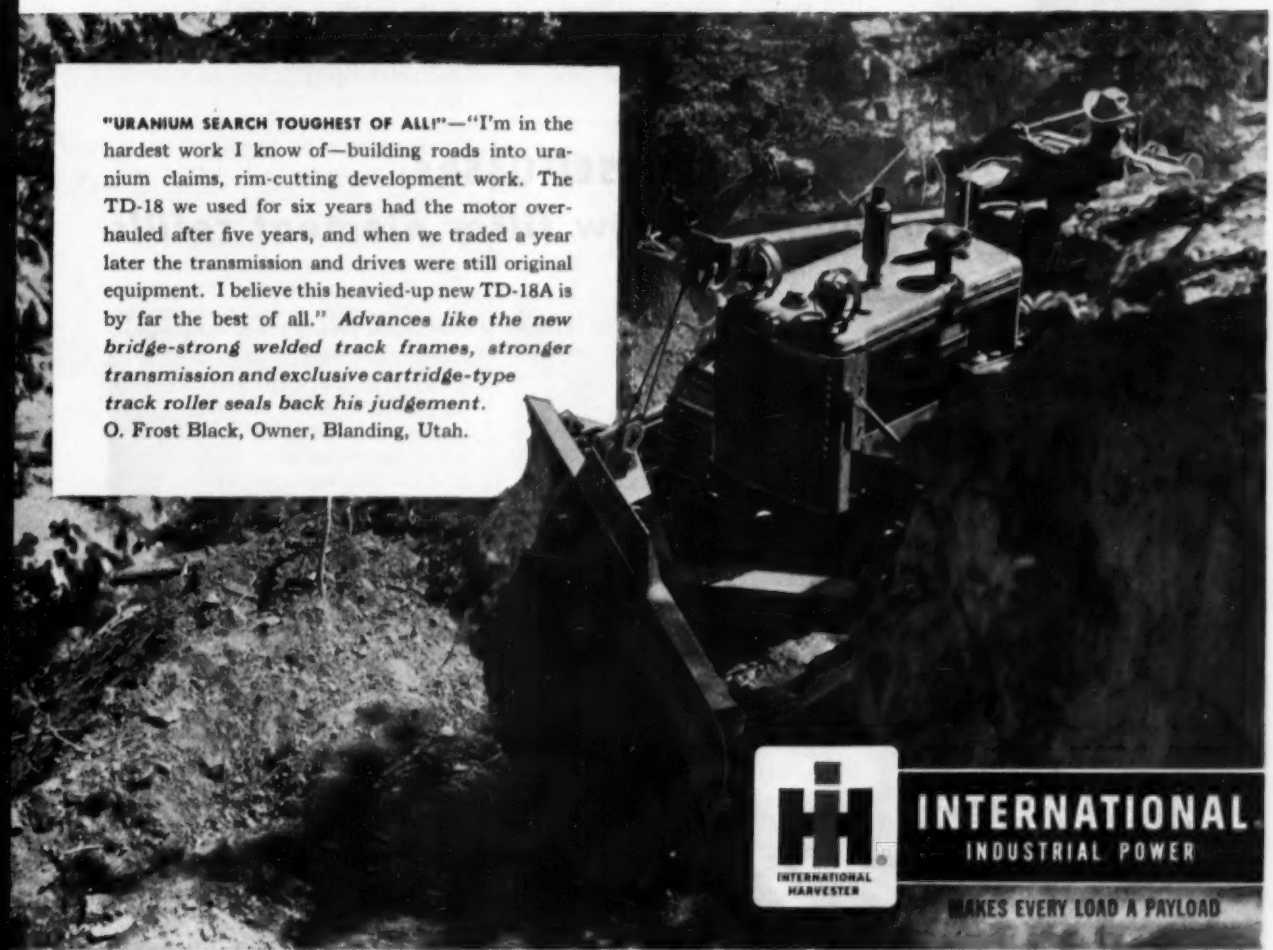
"EVERY LOAD'S A PAYLOAD"—"My International-Drott TD-18A Skid-Shovel is built for the operator's comfort. I know, because I'm the operator. It has 360° visibility which no other loader has. Every load is a payload." *No other outfit built gives you the TD-18A's combination of power, visibility and responsive controls. No wonder TD-18A handling ease turns "skinners" into high-producing operators throughout the day!* V. S. Steffes, Owner, Batavia, Illinois.

"OPERATORS FIGHT FOR NEW TD-18A"—"The TD-18A's were always good—fast, trouble-free performance and low operating cost made me money. The new TD-18A is stronger and really planned for the man in the seat. It has operators fighting for it." *Big, wide, comfortable cushions; hydraulic steering control boosters, and levers are conveniently grouped on the roomy, non-skid deck!* M. B. McKee, Chickasha, Oklahoma.

"LESS FATIGUE TO STRIP MORE COAL"—"There are two outstanding reasons why I like my new design International TD-18A. First it's designed to strip rugged terrain. And second, the operator can do more with less fatigue. The extended tracks enable working steep terrain with maximum production and safety." *Tough jobs, like coal-stripping, prove the TD-18A excels in ample new gear train strength, too!* Elmer Phillips General Manager, Little Beaver Mining Corporation, Beckley, West Virginia.

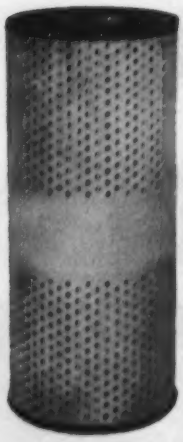
Report on the Decisive Difference

TD-18A Performance



"URANIUM SEARCH TOUGHEST OF ALL!"—"I'm in the hardest work I know of—building roads into uranium claims, rim-cutting development work. The TD-18 we used for six years had the motor overhauled after five years, and when we traded a year later the transmission and drives were still original equipment. I believe this heavied-up new TD-18A is by far the best of all." *Advances like the new bridge-strong welded track frames, stronger transmission and exclusive cartridge-type track roller seals back his judgement.* O. Frost Black, Owner, Blanding, Utah.

Ease into foam-rubber-padded, panoramic-vision seat and see the *decisive difference.* Try new finger-tip power steering, and other big *job-easing incentives* for boosting production, as developed only by International. Prove TD-18A *full-power traction*—note, too, how the gear train is beefed-up to transmit 103 drawbar hp, and then some! Measure what new *300% stronger track frames* mean for *full-capacity performance* under slam-bang conditions. Compare how new *cartridge-type track roller seals,* and other International *downtime-prevention engineering,* beat anything else on tracks. Ask your nearby International Industrial Power distributor for a new TD-18A demonstration.



The relief valve on a full-flow filter serves as a safety factor, pure and simple. If the filter element clogs, the valve opens so that the bearings will not have to run without any lubrication at all.

But . . . don't let this safety function of the relief valve lead you to think you can get along with substitute filter elements that have less than the requisite capacity for your diesel's lube oil system.

Every time the relief valve opens, dangerous, abrasive-laden oil pours into your engine. Sure, it's better than *no* oil, but it doesn't take much of it to start serious bearing wear.

Your International-Harvester dealer-distributor knows that inadequate filtering can ruin precision parts in a matter of hours. That's why he makes a point of giving you only manufacturer-approved replacement filter elements built to I-H's exacting engineering standards by Purolator.

WARNING TO DIESEL USERS:

pay attention to your full-flow filter element refills

International UD-24 and UD-18 diesel engines power a 30-inch rock pulverizer.

PUROLATOR PRODUCTS, INC., Rahway, N. J. and Toronto, Ontario, Canada

TWO-WAY RADIO . . . Continued from page 118

dollar for dollar, we've ever made," declares Bill Noonan, partner in Noonan Construction Co., Pensacola, Fla. This 25-yr-old contracting firm, specializing in heavy construction, operates in the Southeastern part of the country as far west as Texas.

The firm, with a spread of 4 bulldozers, 2 scrapers, 3 motor graders, a front-end loader, 5 draglines, 2 truck cranes, 18 dump trucks, 3 trailers, 5 flat-decks, 6 pick-ups, 2 complete paving outfits and an asphalt plant, finds two-way radio indispensable—particularly from a maintenance angle. When a piece of equipment is down, the shop office is notified immediately and steps taken to divert other equipment to fill the "hole." Parts are ordered and work order repairs started immediately. No appreciable downtime is logged against equipment waiting to be repaired.

"The most useful function of our two-way radio is its value in helping to plan, schedule and coordinate the next day's operation. Every night our superintendent and foremen and someone here in the main office get on the radio. We discuss what we have accomplished during the day and then we make plans for the next. Why the savings in auto-mileage alone, running to and from the office or trying to locate a telephone will just about pay for the radio," says Noonan.

This firm has six mobile units in the field and a GE 60-w transmitter with remote control.

Big Savings

The Gil Wyner Co., contractors out of Malden, Mass., have been using RCA two-way radio since 1951. Since the installation of mobile radio, this firm claims in some instances it has saved up to 40% of man-hours and equipment time. On occasions, they get 2 hr more production in a 10-hr day because of radio.

According to Murray H. Wyner, chief purchasing agent, who is especially conscious of the cost involved in machinery breakdowns, shifting men and machines and locating men: "Some of our jobs are 4 to 7 mi long, and our men are spread out all over the place. But with our radio installation, we can reach them directly. We no longer send out messengers looking for someone. We have constant two-way contact with our master mechanic and truck foreman. This system helps move trucks, repair flat tires and fix breakdowns. Radio gives us complete control of operations on all points of the job."

Equipment Manager Mel Wyner says: "The radio set-up is like one large party line over which everyone hears all that is being said."

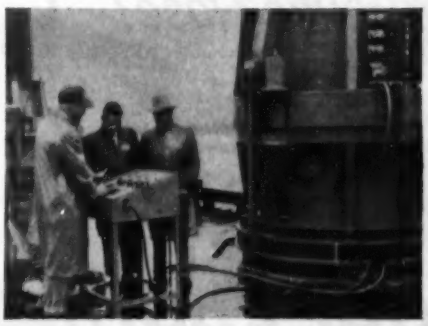
The RCA Fleetfone radio installation consists of three 70-w stations and twenty 30-w mobile units. The master station is located at company headquarters in Malden, and the other two are in field shacks which are moved from job to job. A leased telephone wire connects the transmitter, located 3 mi from the home office, with a remote-control unit.

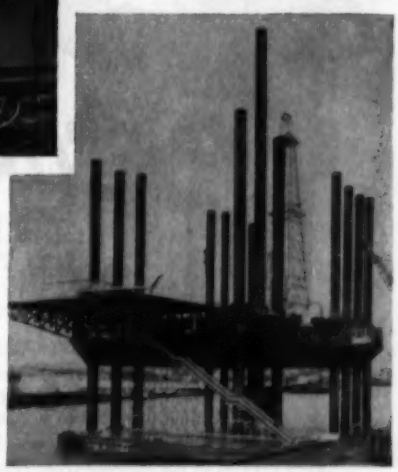
Equipment using two-way radios are: Two semi-trailers; two superintendent's cars; president and vice-president's autos; chief engineer, equipment superintendent, two expediters' pickups; one master mechanic's pickup; one truck foreman's pickup; and eight general-purpose pickups.

Where cars and pickups cannot go, radio does. The clearing foremen and men blazing trails in remote sections use a small hand-portable system which weighs

How **WESTINGHOUSE PNEUMATICS**

Solved a difficult control problem





On this Mobile Drilling Platform, built for the Offshore Company, a Westinghouse Air Brake Company pneumatic system controls the operation of DeLong air jacks which raise or lower the platform.

With this control system, the jacks are operated together from a master control station, or individually to suit the underwater conditions encountered.

Westinghouse pneumatic controls are used because they give this selectivity, and because they are simpler, lighter and easily serviced.

If you are designing new equipment, or are re-building older equipment, let us show you how Westinghouse pneumatic controls can simplify the job. Just send the coupon.

Westinghouse Air Brake Co.
Industrial Products Div., Box 36
Wilmerding, Pa.

Please send information on your Pneumatic Controls. I am particularly interested in controls for .....

Name .....

Company .....

Address .....

Westinghouse Air Brake
COMPANY

INDUSTRIAL PRODUCTS DIVISION WILMERDING, PENNSYLVANIA

about 20 lb and is packed in a knapsack across the shoulders. It has a range of 10 mi.

Reduces Downtime

Sometimes machinery has to be rescued. A heavy bulldozer employed in pushing peat out of a bog suddenly started to sink. The superintendent radioed a trailer driver 1 mi away to pick up a bulldozer and rush it to the site. The second bulldozer arrived and within the hour the first bulldozer had been rescued. Without radio, the sinking bulldozer might have been out of operation for a day or longer.

"Radio saves 40% of my time," states Master Mechanic Joe Risi. "It makes me work 90% harder, but it helps keep costs way down."

Truck Foreman Matty Bloom uses his radio to get parts faster. "I figure radio saves about 15% of the time in supplying parts. When the part is needed at a spot a long way from the field office, radio really pays off. Without radio I would have to make regular rounds and that takes lots of time."

Invaluable Safety Aid

"Who doesn't have accidents on construction jobs?" Mel Wyner asks. "Now when someone does get hurt, he stands a better chance. By radio, ambulances can be summoned, and the hospital can be alerted that the injured man is on his way. For example, recently an oiler on an airfield construction job got his leg caught in a hoist cable. A radio call was put in to the transmitter-construction shack 2 mi away. They telephoned a doctor. Ten minutes after the accident happened a doctor was on the scene. He extricated the oiler's leg and got him to a hospital within a half-hour. Two-way radio in all probability saved this man's life."

A home building contractor in Tallahassee, Fla., Ferrell Construction Co., says: "A radio breakdown in our office is more of a loss than having a man not show up for work."

Carl E. Ferrell, one of two partners, says: "It enables us to be on the job and yet still be available. We build residential buildings about 12 at a time. We figure by the use of radio, we can build two 'extra' houses each year.

"Our frame, brick and trim foremen visit every job daily, and they find out what materials are needed and radio in. Our dispatcher, who is also our receptionist, takes their requests, then orders the material from the supplier. She then radios back and tells them when materials will be delivered. All this takes about 10 min." They have one master station and two mobile units.

In Evanston, Ill., O'Loughlin Material Co. uses Motorola radio equipment in eight ready-mix trucks. Dispatcher Jack Blessings says: "If you've got a profit-wrecking situation—and there are many in this business—the way to get out of it is 'talk' yourself out of it over the radio."

Whatever the chore is, the radio performs. The radio has "arrived." It has earned a permanent assignment in an industry where time is always running out. But are the contractors content? No sir! As one contractor put it: "Radio is fine. We *know* what is going on, but we are waiting and expect someone to come out with TV for contractors. Then we will be able to *see* what's going on and never have to leave the office."

PERMITS THE USE OF MORE ABRASION-RESISTANT, RUBBER-COVERED HOSE

Insure longer wear in your hydraulic hose assemblies—and at the same time, save assembly time by avoiding old-fashioned skiving. Joy Surgepruf re-usable couplings make *both* advantages possible. Their exclusive "double-wedge" grip lets you use tough, abrasion-resistant, rubber-covered hose instead of the braided type—without any need for skiving the hose at the connection.

NO SPECIAL ASSEMBLY TOOLS REQUIRED

You need no mandrels or other special tools to make up Surgepruf assemblies. No extra expense or special technique is involved.

CAN BE RETIGHTENED WHEN LOOSE ON THE HOSE

Machine vibration or hose flexing can loosen any hydraulic coupling on the hose in time, but Surgepruf Couplings can be easily, quickly retightened on the job to stop a leak—*another* exclusive feature.

Surgepruf Hose Couplings are made to JIC Standards. Assemblies are available in many sizes and lengths, and in both single and double-wire reinforced types for medium-high and high pressure service respectively. *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*

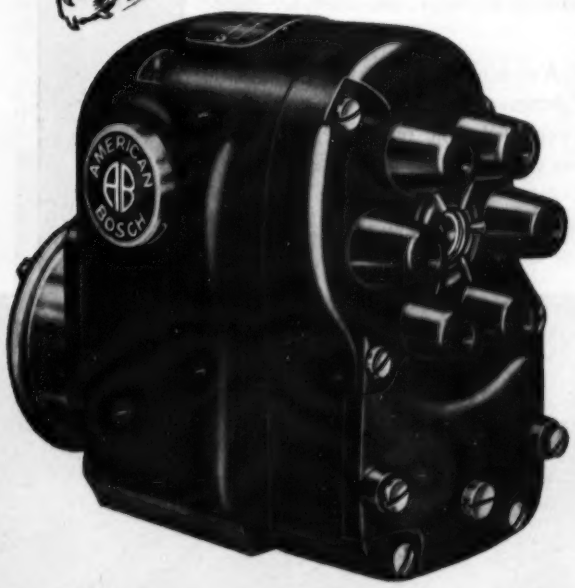
Get complete data on Surgepruf:
WRITE FOR BULLETIN H-100a
Consult a Joy Engineer

JOY
HYDRAULIC ASSEMBLIES THAT GIVE YOU MAXIMUM RELIABILITY

W&D H5506

INSTANT POWER

for dependable ignition
AMERICAN BOSCH MAGNETOS



Better to start with — best in the long run. That's the power-packed story of American Bosch Magnetos . . . today's finest ignition units. Many advanced features give them greater power for split-second starting and premium engine performance PLUS built-in stamina that assures years of constant, trouble-free service in construction equipment. That's why they're so widely used as original equipment by many leading engine builders.

For your every replacement need—from the largest, heavy duty engines with either high or low tension ignition, down to today's compact, high-speed power units — there's an American Bosch Magneto precisely engineered for maximum efficiency at all operating speeds and loads. Moreover, American Bosch gives you all the advantages of one of the world's largest and most efficient Magneto Service organizations through your nearby AB Service Agency. Write today for application data on your high or low tension ignition engines. American Bosch, Springfield 7, Mass. A Division of American Bosch Arma Corporation.

AMERICAN BOSCH

Automotive and Aviation Magnetos

Generators and Regulators

Components for Aircraft Engines

Small Electric Motors

Electric Windshield Wipers

Diesel Fuel Injection Equipment

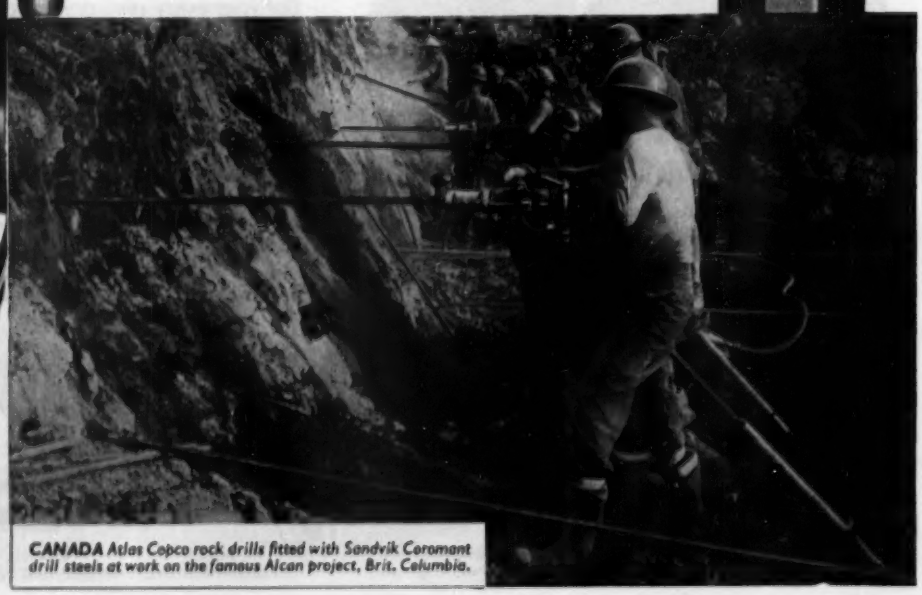
THIS

FITTED TO THIS

STARTED A NOISY REVOLUTION

This was no quiet affair for it concerned—and radically altered—existing drilling practice. It started with the introduction of a new drill and a special drill steel developed to work together. This revolutionary drilling unit is the Atlas Copco light rock drill and the Sandvik Coromant tungsten-carbide-tipped drill steel. The measure of this drilling unit's success has been its rapid, wide-scale adoption throughout the drilling world—accompanied, wherever it is in use, by a change to *faster, smoother, far more economical methods.*

MORE DRILLS AT WORK. A striking advantage of this unit is the compactness and lightness of the Atlas Copco rock drill. This has practically swept away the two-man, bar-rigged drifter and with it, faces cluttered with unproductive crews and bulky equipment. *Atlas Copco rock drills are one-man machines.* That means *more* machines engaged on *actual* drilling operations at one and the same time.

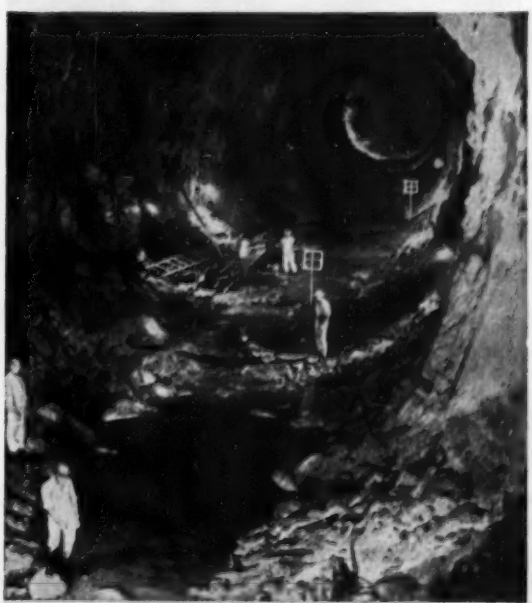


***CANADA** Atlas Copco rock drills fitted with Sandvik Coromant drill steels at work on the famous Alcan project, Brit. Columbia.*

DEVELOPED TOGETHER. The Atlas Copco light rock drill is only half the story of this drilling unit. From the earliest research and experimental stages, its development has been tied with that of the Sandvik Coromant tungsten-carbide-tipped drill steel. Work on both has always been towards a combination rock drill and drill steel (a drill and steel produced separately could never be as well balanced or give equivalently high performances), and has been the basis of this drilling unit's outstanding triumph.

MILES OF DRILLING TESTS. A highly important contribution to the development of this revolutionary drilling unit are the hundreds of miles of test drilling carried out each year by Sandvik at their own mine, in close co-operation with Atlas Copco. Other tests are carried out in the mine's rock-drilling laboratory and by Sandvik research teams in Sweden, South Africa and Canada. All this 'backroom' work serves to provide valuable practical information naturally influencing the enormously skilled drill steel production stages. In this, Sandvik are the world's only manufacturers of drill steels to control every phase—from the mining of the iron ore and the processing of wolfram ore to the final, *extra-hard* tungsten-carbide-tipped drill steels.

DRILLED 800 MILLION FEET. Atlas Copco drills and Coromant steels are today's most widely used pusher leg drills and integral steels. This combination is at work down mines and on construction projects throughout the world bringing *trouble-free progress, faster times, new economies and beating schedules and records.* Could there be anything more conclusive of how complete a revolution this drilling unit started than to state that in 1954 it was responsible for drilling no less than 800 million feet—or nineteen times through the globe!



BRAZIL *This circular discharge tunnel for the Paulo Afonso project was drilled by Atlas Copco rock drills fitted with Sandvik Coromant drill steels*

SWEDEN *An Atlas Copco rock drill — a one-man machine — in operation down the Persberg Mine. It is fitted with a Sandvik Coromant drill steel.*

Atlas Copco Compressed Air Equipment is manufactured or sold and serviced in 48 countries throughout the world by the *Atlas Copco Group*, which embraces companies trading under various names such as Atlas, Atlas Diesel, Atlas Polar, Atlas Copco, Copco, Delfos and Sampa.

MAIL THIS COUPON to the most convenient of the addresses given here:
U.S.A., Copco Pacific, Ltd., 930 Brittan Avenue, San Carlos, California; Copco Eastern, Ltd., P.O. Box 2568, Paterson 2, N.J.; CANADA, **Canadian Copco, Ltd., Montreal, A.M.F., Quebec;** MEXICO, Atlas Copco Mexicana, S.A., Apartado Postal 56, Torreon, Coahuila; PERU, Compania Atlas del Perú, S.A., Apartado 2982, Lima.
UNITED KINGDOM, The Atlas Diesel Co., Ltd., Wembley, Middx.; FRANCE, Atlas Polar S.A., 29, Rue Marbeuf, Paris 8e; HOLLAND, N.V. Holland-Atlas, P.O. Box 6056, Rotterdam; ITALY, S.A.M.P.A.; Viale Marche 15, Milan.
AUSTRALIA, Australian Atlas Company Pty., Limited, P.O. Box 54, Auburn, N.S.W.; SOUTH AFRICA, Delfos Pty. Ltd., P.O. Box 504, Benoni, Transvaal.

Readers in countries outside those listed above and who do not know the name of their local Atlas Copco company or agent, please write, in the first instance, to AB Atlas Diesel, Stockholm 1, Sweden.

Please forward details of ***Atlas Copco Rock Drills and Sandvik Coromant Drill Steels.***

NAME _____

COMPANY _____

ADDRESS _____

_____

* I am also interested in other Atlas Copco equipment (please state which below)

_____

1//

* *Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint Spraying-Equipment*

THE ATLAS COPCO GROUP OF COMPANIES

STAYS STABLE ...Hot or Cold!

Sinclair JET LUBRICANT won't thin out at high temperatures. It maintains lubrication at frigid temperatures. This superior product stays put on heavy exposed gears and circle tracks. It resists wash-out, throw-out and drip.

JET LUBRICANT saves money, too, because it lasts longer . . . reduces lubricant consumption . . . helps to lower power consumption. No heating is required to make it usable direct from its container.

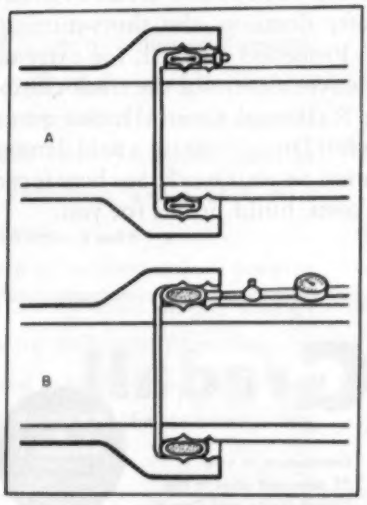
There are *more* reasons why the right grade of JET LUBRICANT and other Sinclair products can improve your operations. Why not let a Sinclair Lubrication Engineer help solve *your* lubrication problem. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y.

SINCLAIR JET LUBRICANT

CLAY PIPE WITH PRESSURE JOINT goes down into trench to form part of a sewerage line. Pressure joints, made in sizes ranging from 8 to 36-in. dia, protect against infiltration, improve flow characteristics and provide flexibilty to absorb vibration.

GROUT PUMP supplies necessary pressure to inflate the joint with a minimum of hand pressure. Dial indicator measures pressure.

Gasket Forms Pressure Joint for Clay Pipe



GASKET FITS around spigot end of pipe about ½ in. from end (A). Joint is inflated (B) to 50-60 psi by grout pump, and metal collar is squeezed shut to complete seal.

A NEW PRESSURE JOINT for vitrified clay pipe makes pipe laying easier and faster, particularly in wet trenches.

To form the pressure joint, a hollow rubber gasket, similar to a tire inner tube, is placed around the spigot end of a length of pipe and inserted into the bell end of the adjoining length. A grout mixture—4 parts portland cement, 2 to 2 1/3 parts water and 1 part special TJ-41 compound—then is pumped by hand into the gasket through a valve. The joint expands uniformly under 50 to 60-psi pressure. When the grout sets, it forms a tight, infiltration-proof seal.

The grout pump used to inflate the pressure joint consists of a reservoir for the grout, a hand-operated vertical pump, a pressure gage and a hose with nozzle. It stands upright and may be located either outside or in the trench. Pressure of the grout from the pump is measured by a dial indicator on the hose nozzle.

G. Alfred Krebs Co., Newark, Ohio, contractors, recently completed at Cambridge, Ohio, one of the first installations in the eastern part of the U.S. with these pressure joints. The trench was 16 ft deep, and shifting sand and water required heavily braced sheeting. Despite the fact that a pump was in operation full time, water seeped into the trench so fast the pipe could not be kept dry enough to make a hot-poured joint. Use of the pressure joint enabled the contractor to complete the job.

Patents for the pressure joint are owned jointly with other manufacturers by the 15 member manufacturers of the Clay Sewer Pipe Assoc., 5 East Long St., Columbus 15, Ohio.

Put a GRADALL® on the job and you'll put more PROFITS in your pocket!

Crawler-Mounted Gradall with boom extension smoothly dresses slope on Oklahoma City Floodway project – winning a second contract in the process because of its cost-cutting efficiency. It also lined this bank with gravel, sand, and rip-rap.

THAT'S been the experience of Gradall contractors all over the country—on big contracts and small.

Why? Because this single machine handles many *different* jobs, using its quickly interchangeable attachments, doing the work of several specialized machines. It has the power and the speed to get jobs done quicker, often work that no other machine can even touch. And Gradall's smooth *arm-action* does the job better, eliminating costly hand labor, working to as fine as ¼" accuracy.

And whether you're a "big" or a "little" contractor, you'll make more money with a Gradall because you'll keep it busy, all year long. Owners' records invariably show that their Gradalls put in more on-the-job hours every year than any other equipment!

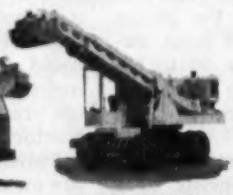
Now, besides the famous Standard Carrier Gradall, with its speed and mobility, you can also choose the Crawler-Mounted Gradall, for greater flotation—the short-turning, Self-Propelled Gradall, for extreme maneuverability—or the track-climbing Railroad Gradall. See your Gradall Distributor for a field demonstration on your work. See how it can cut costs, build profits for you.

®Reg. U. S. Pat. Off.

GRADALL CUTS COSTS, BOOSTS PROFITS ON ALL THESE JOBS—AND MANY MORE!

- Hand finishing and clean-up
- Excavating and loading
- Trenching and backfilling
- Snow and ice removal
- Ditch digging and cleaning
- Grading and sloping
- Materials handling
- Ripping and loading pavement
- Placing culverts, tanks, curbs, etc.
- Working under bridges and around other structures
- Loading boulders

GRADALL—
STANDARD CARRIER



SELF-PROPELLED
GRADALL

RAILROAD
GRADALL

Gradall
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880

Distributors in over 75 principal cities in the United States and Canada.

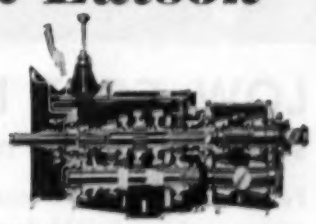
YOU CAN DO IT BETTER, FASTER, FOR LESS WITH A GRADALL

Big loads, faster, speed new dam for Southern California Edison

Here is one of a fleet of Kenworth 801 earth movers, used by Southern California Edison to excavate and fill at their recently-completed dam in the Vermillion Valley of Central California.

Each of the Kenworths is powered by a 200 hp diesel driving through a Fuller 10-F-1220 Transmission—hauling a rated payload capacity of 36,000 lbs. This 10-speed heavy-duty transmission has even, short steps (average 30%) between ratios that help maintain rpm at the most efficient, highest economy range.

On job after job, where loads are the biggest and the going is the toughest, you'll find Fuller Transmissions putting horsepower to work efficiently. Next time you order heavy-duty construction equipment, specify Fuller Transmissions.



Model 10-F-1220, Fuller heavy-duty Transmission designed for use with engines up to 1220 cu. in. displacement.

Fuller TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

On-the-Job CONTRACTOR-LABOR RELATIONS

by LEON B. KROMER, JR.

It's a Tug-of-War Over NLRB Post

AN UNDERCOVER BATTLE is going on inside the Eisenhower Administration over who will be the next chairman of the National Labor Relations Board. The resignation of Guy L. Farmer, the last chairman, took effect Aug. 24.

Labor Secretary James P. Mitchell is plugging for the appointment of a liberal Republican to the post. Commerce Secretary Sinclair Weeks wants a conservative in the job.

It's pretty much the same situation that arose over the last appointment to the board—and resulted in an "unknown," South Dakota Judge Boyd Leedom, getting the job.

Who wins this contest will be important. The next chairman will be "swing man" on the board between the two Democratic holdovers and the two Eisenhower appointees. His may be the decisive vote in many of the critical areas of labor-management relations still to be ironed out.

Whoever gets the appointment, the NLRB will be undermanned until Congress meets again. The new chairman cannot take office until his appointment is approved by Congress. That means decisions on many of the most important and controversial questions before the NLRB will be delayed.

A Few Answers Would Help

There are a lot of unanswered questions about federal labor law. Guy Farmer listed some of the most significant shortly before he resigned as NLRB Chairman. Among them were these:

- What subjects must the employer agree to include in contract talks to avoid the charge of refusing to bargain in good faith? The number of appropriate subjects for collective bargaining is growing steadily. Talks now cover pension and stock purchase plans, group insurance and bonus payments. Where is the limit?

- How legal are "hot cargo" clauses? Is a clause prohibiting an employer from handling goods of an "unfair" or struck company valid? Is a strike to obtain such a clause an unfair labor practice? Is it a defense in a secondary boycott case?

- When does the employer's right to discharge an employee for disloyalty violate labor's right to engage in concerted action? What are the limits to the rights of both the employer and the union in these situations?

- Who can use an employer's property for union purposes—as in an organization drive—and to what extent? *(Continued on page 135)*

LOW COST PORTABLE HEAT
saves time and money for contractors

For only a few cents an hour in fuel, you can dry plaster, fast, even on cold or humid days; pour and cure concrete safely at any temperature and keep men working, inside or out, in freezing weather. That saves hours of time . . . and time means money.

Your Master Heater rolls into place, starts at the flip of a switch. You don't need a vent. Three models put out 100,000; 160,000 or 400,000 BTU's per hour; burn inexpensive kerosene or fuel oil.

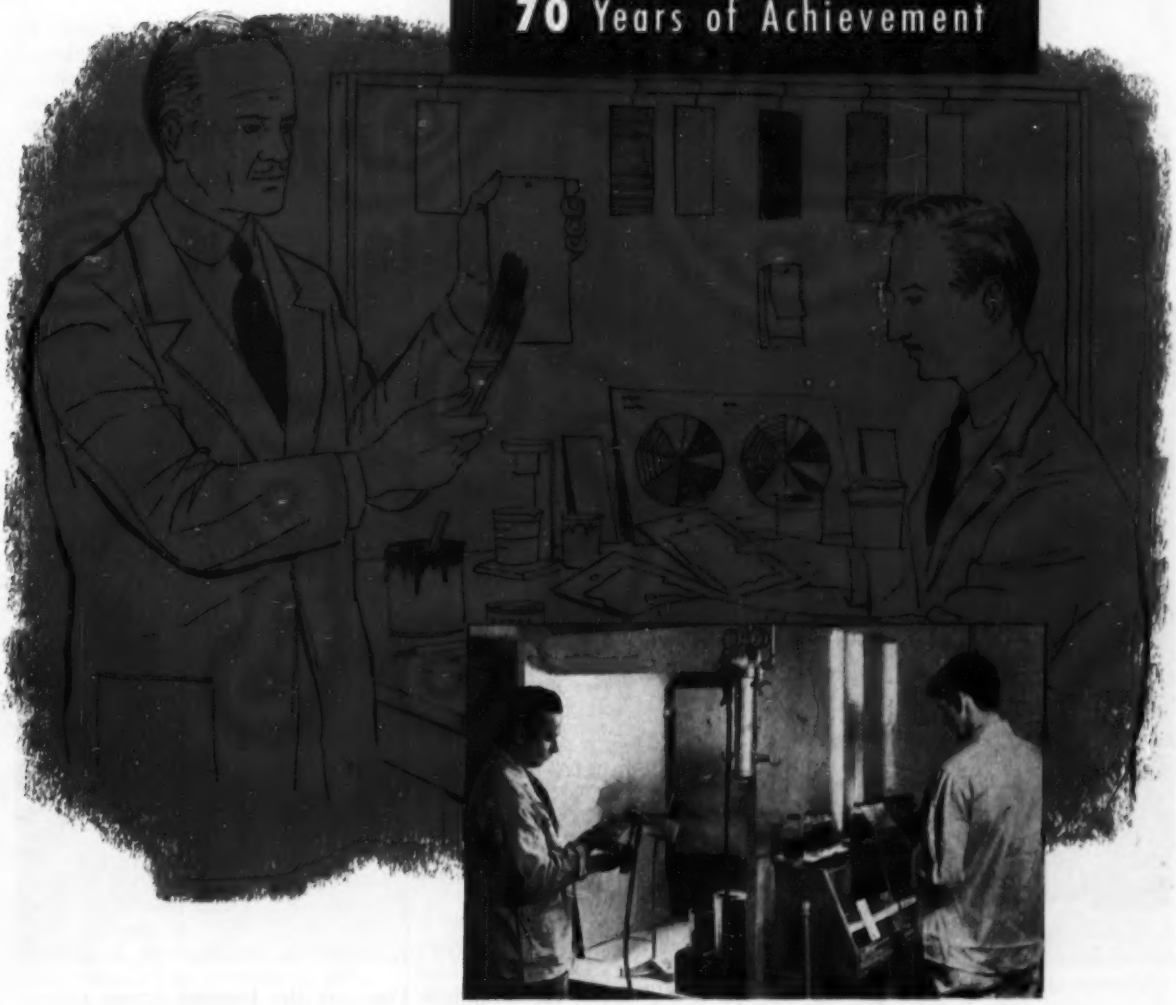
The low price is repaid time after time in hours saved and workmen working.

Write for full information or see your Master distributor.

MASTER VIBRATOR COMPANY
343 Stanley Ave., Dayton 1, Ohio

MASTER

70 Years of Achievement



Years come and go bringing with them new and better methods of operation. This is quite apparent at TOUSEY, where color matching, like other phases of manufacturing control, has been greatly changed in the past 70 years.

Gone are the yesterdays when color paddles were slowly and tediously painted by hand. Today the spray gun has replaced the brush — in the lab as well as the production line. We know that other changes are to come... changes that we are ready to make in order to keep up with the times and improvements.

Perhaps we can help with your finishing problems— why not let us try? Write today.

TOUSEY PRODUCTS

DURACOTE for DURABILITY

TOUSEY VARNISH COMPANY 520 W. 25TH ST., CHICAGO 16, ILLINOIS

If this Isn't the WORLD'S BATCHING RECORD ...We'd like to know it!

With a BUTLER Roadbuilders Plant as the forward passer on the team, the Sargent Construction Company — on the Ohio Turnpike — laid 4368 lineal feet of concrete pavement 24 feet wide and 10 inches thick — *in one 16 hour day.*

The BUTLER Plant dished up that volume of concrete in 2424 batches.

Slide rules, gentlemen! That's at the rate of over 2½ batches per minute. And mind you, not just for one minute, not for just 10 minutes — but steadily for 16 long, gruelling hours.

The BUTLER Plant tossed these 2424 passes to two 34E pavers working in tandem. Even the large #44 elevator sweated to keep pace with BUTLER (and Sargent) batching.

Want more statistics?

21,798 bags of cement batched in 16 hours.
3,148 tons of stone
1,695 tons of sand

Moral? If you want to establish World's Records in production and profits — go BUTLER!

Want to find out about unbeatable portability in BUTLER Roadbuilders Plants? Just send a postcard for Bulletin 205. Savings of hours of downtime during moves often spell the difference between a loss or a handsome profit. Send that postcard — today.

BUTLER BIN COMPANY

949 BLACKSTONE AVE. • WAUKESHA, WISCONSIN

LABOR . . . Continued from page 132

• Does the filing of a 60-day strike notice permit a union to call a strike before the contract's termination date? This issue is on its way to the Supreme Court.

Staff Change in NLRB

One change in NLRB staff already has taken effect. General Counsel T. C. Kammholz has named Kenneth C. McGuiness of Berkeley, Calif., to be Associate General Counsel succeeding William C. Murdock.

McGuiness will have responsibility for the operations of the Board's 21 regional offices. He was special assistant to the General Counsel before the appointment.

Watch Out for This Sales Pitch

Has an advertising salesman ever urged you to take an ad in a particular labor publication for goodwill purposes? It's not uncommon. Frequently, salesmen assure contractors that by taking ads they will obtain the goodwill of union officials and get more cooperation in labor disputes. Other arguments you may hear are that the advertising revenue goes into a fund to fight Communism or for educational purposes or that the publication has the support of thousands of AFL unions.

Most of the time this is just the sales pitch of an advertising salesman who probably works on a strict commission basis. Probably the publication is not sponsored by the AFL nor supported by AFL unions. Some international AFL unions—and the AFL national headquarters—have made considerable efforts to disavow many such publications.

But still contractors sometimes are taken in. It happened not long ago to a contractor we know. He signed an order form agreeing to pay $100 for an advertisement in a "labor" newspaper. Then, he started to inquire about some of the statements the salesman had made to him. He talked with business agents of the building trades unions whose members he employed. He learned that only two of them had ever heard of the publication, and they both told him it did not have the support either of the locals or the international unions. He could have saved $100 by inquiring about the publication before he signed the order form.

The crane went down... but we weren't out!

Our Hartford Contractors' Equipment policy paid us $8,269.02 *(Based on Company File #HM53-2037)*

We were wrecking an old bridge to make way for a wider one.

The structure appeared sound. So we brought up our 32-ton crane, and used it for removing the bridge deck.

That wasn't such a bright idea. We'd hardly started when the abutment under the rig collapsed with a roar. The operator jumped clear as the machine toppled into the river.

It cost nearly $900 to get the machine to a shop for repairs. And over $7,300 more to fix it up. Under our Contractors' Equipment policy, the Hartford Fire Insurance Company paid these bills—a total of $8,269.02.

Who'd pick up the tab if one of *your* machines "fell in"?

Or was burned? Wrecked in a collision? Buried under a landslide?

Not you—if you had the broad protection of a Hartford Contractors' Equipment policy. It covers your equipment on the job . . . while being moved from one job to another . . . while idle between jobs. It saves you from loss caused by collision, overturn, explosion, theft, windstorm and many other hazards.

The cost of making sure you have cash when you need it for repairs or replacement is very reasonable. Get full details today from your Hartford Fire Insurance Company Agent or your insurance broker.

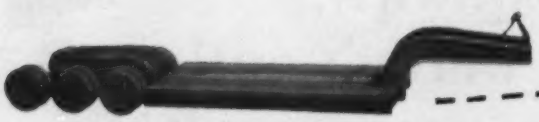
Year in and year out you'll do well with the

Hartford

Hartford Fire Insurance Company
Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey . . . *Hartford 15, Connecticut*
Northwestern Fire & Marine Insurance Company
Twin City Fire Insurance Company . . . *Minneapolis 2, Minnesota*

Talbert Trailers with 15-inch tires afford you the advantage of a low rear bridge height. Single Axle models and drop deck models are also available.

Talbert Trailers with tandem axles and 20-inch or larger tires are ideal for general-purpose hauling. They feature the Talbert Removable Gooseneck* for easy, safe front-end loading.



Talbert Trailers with unique three axle spring suspension enable loads to be spread equally over three axles to meet many state axle weight limitations.

Talbert Trailers with either eight or sixteen tires offer an improved, heavy duty trunnion suspension.

Talbert Trailers with tilting platforms are readily adaptable to any tractor or dump truck for more convenient mobility and greater hauling economy.

Complete Choice!

. . . Talbert offers you a greater trailer selection, unmatched in design to save you more money! For example, Talbert's standard manufacturing procedure includes the use of U.S.S. Man-Ten, Cor-Ten, and Tri-Ten steel in all main beams, position welding and sand blasting. Send coupon below for your free copy of the Talbert catalog—it gives detailed data on all Talbert Trailer models ranging from 10 to 100 tons capacity.

THE TALBERT CONSTRUCTION EQUIPMENT COMPANY

7952 West 47th Ave., Lyons (Chicago Suburb), Ill.
Phone: Lyons 3-3169
Manufacturers of Talbert Low-Bed Trailers and Dump Semi-Trailers

Talbert Construction Equipment Co.
7952 West 47th Avenue
Lyons (Chicago Suburb), Illinois

Send me your latest detailed catalog at no cost or obligation.

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CITY_____ ZONE____ STATE_____

Talbert

Custom Design at Production Prices

"Our TD-9 Skid-Shovel Saves 20 Gallons of Fuel Daily"

CHARGING THE HOPPER at the rate of 125 yards hourly is just one job the TD-9 INTERNATIONAL DROTT Skid-Shovel handles so fast and efficiently. It also strips overburden and loads crushed gravel into haul trucks.

Gravel plant owner makes big equipment savings, too, replacing bigger crawler-dozer with INTERNATIONAL DROTT loader

Ray Garrett, gravel plant owner at Montrose, South Dakota, cut his equipment investment and fuel bill by putting a 41-horsepower TD-9 INTERNATIONAL DROTT Skid-Shovel to work on his materials handling.

Here's Ray's own report on his double-barreled savings:

"We feed up to 125 yards of gravel into the crusher hourly. A larger crawler and dozer used to do the job that's now being handled by the TD-9 INTERNATIONAL DROTT *Skid-Shovel.*

"There's been no drop in production but we're saving 20 gallons of fuel daily in addition to the reduced equipment cost. The Skid-Shovel's a lot more versatile, too, handling many jobs the crawler-dozer was unable to touch."

Chances are you may be wasting power and equipment on your materials handling jobs—if you're not powering them with INTERNATIONAL DROTT Skid-Shovels. Best way to find out is to call your INTERNATIONAL Industrial Power Distributor for a demonstration. You stand to gain plenty—in lower equipment costs, lower fuel bills, greater equipment versatility—so call him soon.

"SHE'S POWERFUL AND FAST," says operator Allen Alagood. *"I have a clear view of the work at all times and the Skid-Shovel is a snap to operate,"* he adds.

INTERNATIONAL HARVESTER

INTERNATIONAL DROTT

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

(Advertisement)

Prefabricated Form System Used For All Types of Construction

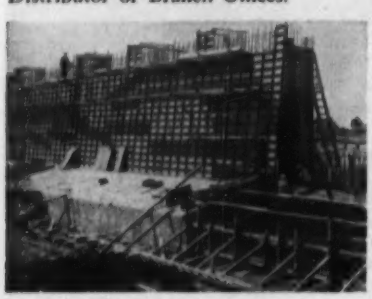
Saves Time . . . Labor . . . Material

UNI-FORM Concrete forms are widely used in all types of concrete construction because they provide contractors with three important advantages: (1) Increased labor productivity — forming crews can erect more contact area per man hour; (2) Guaranteed material and labor savings and (3) Complete flexibility of application.

Simple mechanical assembly of plywood faced, steel-framed UNI-FORM Concrete Forms permits any labor force to become expert in a short time. All forming requirement — inside corners, outside corners, pilasters, one-side alignment and bracing, automatically accurate wall widths, scaffolding, etc. are engineered into, and provided with, the UNI-FORM System.

Circular wall formed with UNI-FORM Panels

Contractors using the UNI-FORM System have the basic equipment to handle any type of concrete construction. Complete engineering service . . . job analysis, forming recommendations, bills of material and forming details, together with field service are available to contractors through the manufacturer, Universal Form Clamp Co., Chicago, or through any of the company's many Distributor or Branch Offices.



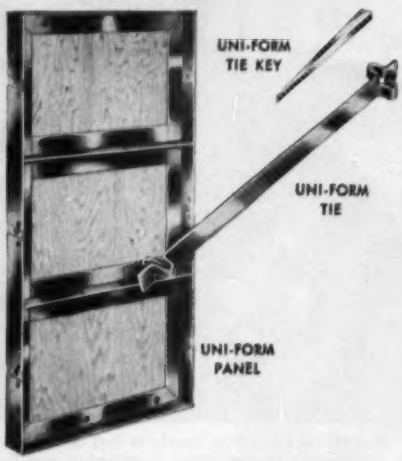
Battered wall forming with UNI-FORMS

A complete catalog, describing the UNI-FORM System of Wall Form Construction is available upon request. Write: Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

UNI-FORM Concrete Forms

SIMPLE . . . FAST . . . FLEXIBLE

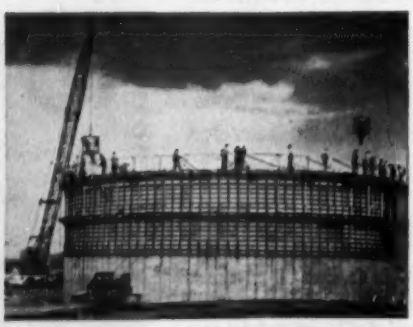
3 BASIC ELEMENTS mean Faster, Easier, More Accurate Forming



Simple mechanical assembly of UNI-FORM Concrete Forms provides faster forming . . . easier stripping and lowest all around costs. Ready to use when they reach the job, UNI-FORMS guarantee time, material and labor savings on any forming job. Let us prove UNI-FORM advantages . . . send us a set of prints for free recommendation and proposal on your next job. There's no obligation.

FORM CIRCULAR WALLS AT LOWEST COST

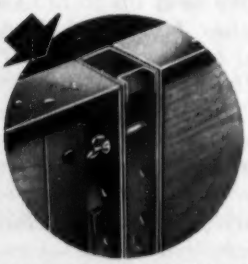
- **No alignment or bracing on outside.**
- **Minimum excavation required.**
- **Free working area.**
- **Maximum job safety.**



UNI-FORMING Circular walls costs less per square ft. of contact area . . . provides unhampered steel setting . . . greater control of concrete placement. Write for details on UNI-FORMING circular walls.

PREFABRICATED CIRCULAR WALL FILLER

Used on outside form only . . . assures true form curvature with standard UNI-FORM Panels.



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CLEVELAND OHIO • BALTIMORE MARYLAND • HOUSTON, TEXAS
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SERVICE WHEREVER YOU BUILD...COAST TO COAST

DISTRIBUTORS IN PRINCIPAL CITIES

Mr UNI-FORM

Copyright 1955 by UNIVERSAL FORM CLAMP CO., Chicago 51, Ill.

Thermoid Hose designed specifically for construction jobs

Thermoid designs and manufactures many types of hose built to give longer service and lower operating costs in a wide variety of specific applications. Here are three that are ideal for rugged quarrying and construction work:

THERMOFLEX—Mandrel-built air hose for extreme service and direct connection to compressors. Smooth, black abrasion-resistant cover.

VERSICON—Most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases. Ideal for use with air-operated tools.

#325 CL SUCTION HOSE—Heavy duty wrapped hose reinforced with rugged wire enclosed in a woven cord carcass. Long wearing tube and cover resists weather and abrasion. Can be restored to shape after crushing.

Thermoid research is responsible for new, better hose construction which makes Thermoid Hose more durable . . . easier to handle. Quarrying and construction work also demands the best in Conveyor Belting and Multi-V Belts. Ask your Thermoid Distributor for complete information on all these Thermoid Products. Or if you prefer, write direct.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

USS HIGH STRENGTH STEELS

give greater strength

more corrosion resistance to concrete mixer

In this Rex Adjusta-Wate Moto-Mixer, USS High Strength Steels were used to increase strength of vital parts, and at the same time to trim off unnecessary deadweight. Where strength was of the utmost importance — in many structural members, charging hopper, discharge chutes, mixer drum and frames, USS MAN-TEN was the USS High Strength Steel selected. In the water tank, where increased corrosion resistance — in addition to strength — was required, the choice was USS COR-TEN Steel.

• • •

United States Steel produces three different grades of USS High Strength Steel—COR-TEN, MAN-TEN, and TRI-TEN—each having distinctive characteristics and each recommended for certain end uses where its specific properties will assure longer service and greater over-all economy. All three grades have a yield point 50% higher than carbon steel and all offer properties which allow greater strength and toughness to be built into the vital parts of machinery, equipment and structures most prone to failure.

In the construction industry these steels can be used to replace carbon steel in the vital parts of all kinds of equipment to increase service life without increasing dead weight. And if the use of thinner sections is possible, they can (1) reduce equipment weight without reducing its strength, or (2) increase the size and capacity of equipment without increasing the total weight or the power needed to move it.

For more information on these high-quality, service-tested steels, contact our nearest office.

The Rex Adjusta-Wate Moto-Mixer, manufactured by the Chain Belt Co., of Milwaukee, Wisc., is shown here pouring concrete for a suburban street. The design of this mixer utilizes the maximum legal load limits on the front axle as well as on the rear axle, and has greatly increased the legal pay load that a ready mix operator can haul. Here is another place where the strength of USS MAN-TEN Steel pays off.

NOW AVAILABLE

Our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead, giving title or department, to United States Steel Corporation, Room 4742. 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS High Strength STEELS USS

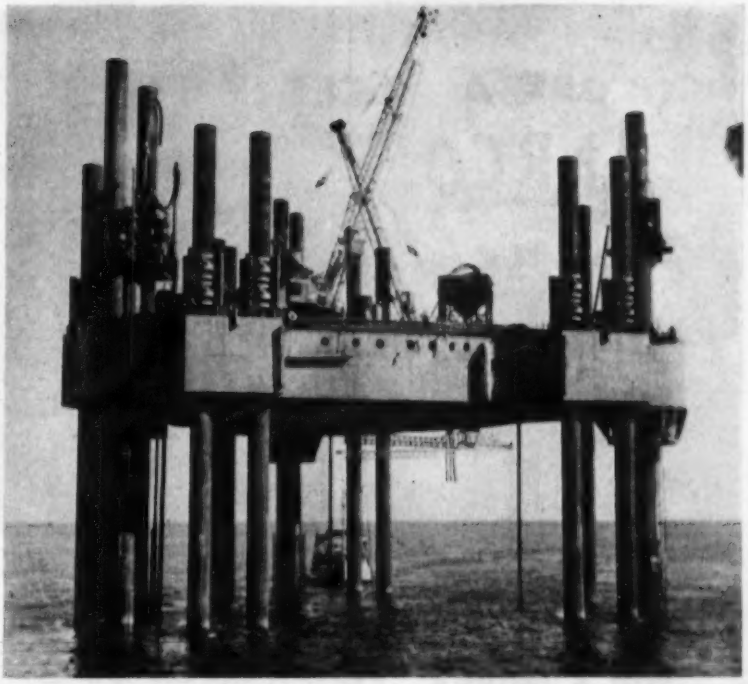
UNITED STATES STEEL

Jacks Raise 6,000-Ton Hull For Radar Unit

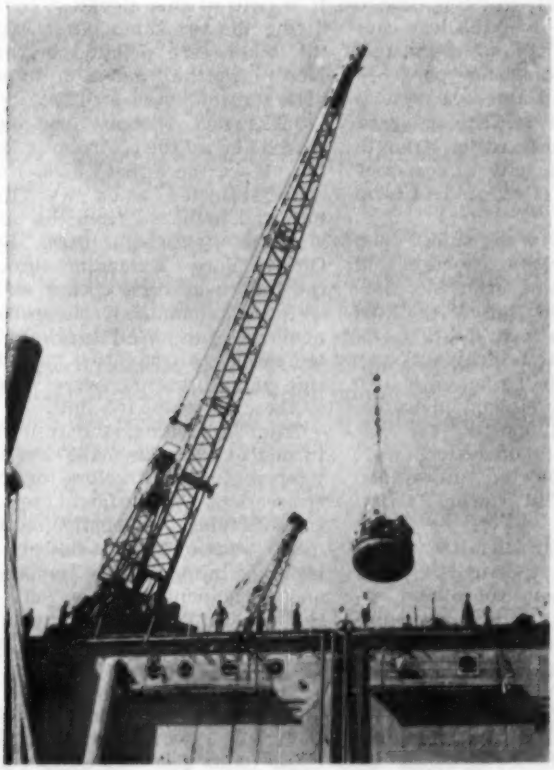
By HENRY T. PEREZ
Editor

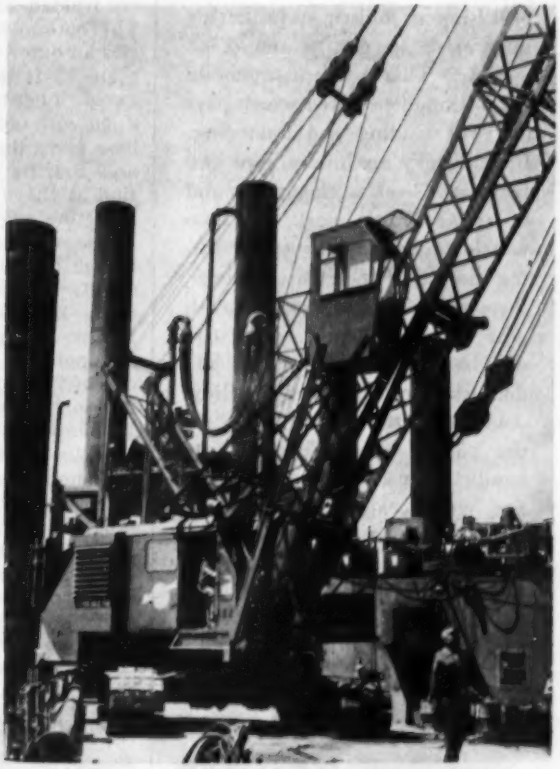
TAKE A TRIANGULAR steel hull measuring 200 ft on a side and 20 ft deep, tow the 6,000-ton unit 155 mi to sea, raise it so its bottom is 67 ft above water, convert this structure into a permanent platform and you have Texas Tower No. 2—the first man-made island for Air Force radar crews defending the U. S. coast from surprise air attack.

Tower No. 2 (number two geographically in a planned line of offshore radar platforms) is now nearing completion 110 mi off the



TEXAS TOWER, its name borrowed from offshore oil drilling platforms, stands on 12 temporary 6-ft dia caissons while its three 10-ft dia permanent legs are put down. Atlantic Ocean is incredibly calm for this spot, 110 mi due east of Cape Cod. Water depth: 50 ft.





MEN AND EQUIPMENT are hoisted 87 ft to radar platform deck by two 60-ton Manitowoc 3900 cranes with 100-ft booms. Cranes are fitted with dual controls and elevated cabs so operators can see over platform edge. Men are swung aboard (left photo) in aluminum cage fastened to inflated 27.00-33 tire tube. Construction crew (80-100 men) lives aboard, works 12-hr day, 7-day week.

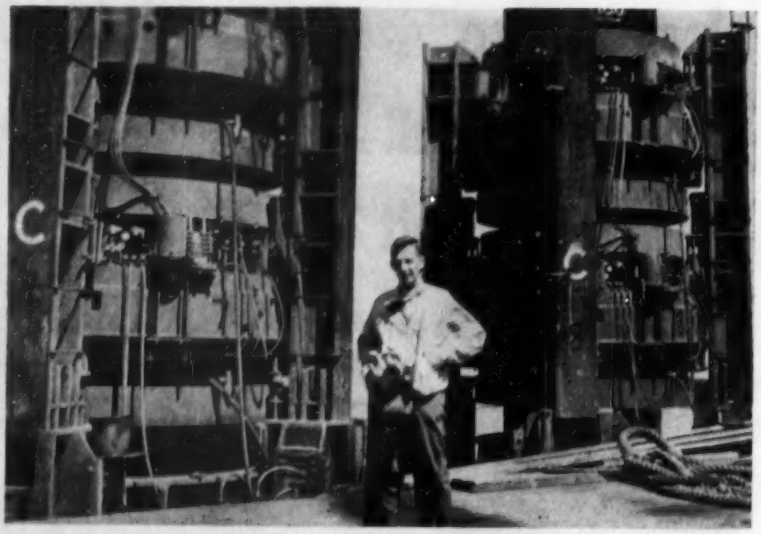
FOR A MOBILE HOISTING RIG

ON MOST HEAVY CONSTRUCTION projects there are innumerable jobs of lifting or hoisting. Often it's imperative to get to the scene quickly. That's where a mobile tractor-mounted Carco winch pays off. For loading and unloading, lifting heavy machinery, pipe and fabricated steel, setting poles, and numerous other work, a Carco winch provides maneuverable lifting power. For a Carco winch, through its rugged, constant mesh gear train, efficiently takes the drawbar pull of the tractor and doubles it for hoisting or pulling. And the Carco winch line gives the added "reach" necessary to handle even an inaccessible load. See your nearest Carco dealer. PACIFIC CAR AND FOUNDRY COMPANY. Branches at Portland, Ore., and Franklin Park, Ill.

50th ANNIVERSARY

WINCHES
For All Industrial Tractors

CARCO



CM&E EDITOR stands in shadow of four of the DeLong 300-ton air-powered jacks that raised 6,000-ton platform 87 ft into the air. There are two jacks on each of twelve caissons. Delayed somewhat by hurricane effects, it required month of August to sink three permanent caissons and concrete their interiors approximately up to mud line.

tip of Cape Cod. It is supported by three 10-ft dia steel-pipe caisson legs that are embedded 48 ft into the hard-packed sand of Georges Bank, where shoal water is but 50 ft deep.

Caissons are of 2-in. steel and are welded rigidly to the platform. The bottom 63 ft of the legs carries an outer caisson of ½-in. steel plate 15-ft in dia, and space between inner and outer caissons is filled with concrete. This enlarged base gives the leg greater strength and bearing capacity. Cross-section at the tip is reduced to form a cutting edge.

The caissons were sunk, open ended, by interior excavation and downward jacking after the platform had been raised to final height. The platform did this lifting operation itself, inching its way upward through the action of two 300-ton jacks in tandem on each of 12 temporary supporting caissons.

Jacks for both operations were DeLong air-powered units, and were the key to Tower 2's fast erection.

The DeLong jack (in two cylindrical sections that encircle the caisson, one above the other) operates much as would a boy shinnying up a tree; the two halves of the jack corresponding to his arms and legs. Around the inside of both sections are rubber tubes that can be inflated to grip the pipe. And between the sections is an inflatable accordion-like tube to force the halves apart. The upper half of the jack is fastened to the platform deck by long structural arms.

In operational sequence, the lower half of the jack first grips the caisson. Then the center tube is inflated to raise the upper half and the attached platform about 6 in. It is held at this elevation by inflating the top tubes, after which the others are deflated and the jack's lower half moves up to prepare for another 6-in. lift.

Jacks and caissons had been placed aboard the platform in Boston. It was here that Tower No. 2 was fabricated as a watertight hull and launched from the shipway at Bethlehem Steel Co.'s Quincy Yard. Extending through the hull near each corner was a well to accommodate the permanent cassions. Well brackets for temporary caissons, two on either side of each corner, were welded to the exterior of the hull.

After launching, the hull was turned over to Raymond-DeLong, joint-venture contractors for tower erection. They loaded necessary supplies and construction equipment aboard and installed the jacking apparatus. Temporary and permanent caissons were set in the jacks, which held them so they did not project below hull bottom.

Temporary caissons, 6-ft dia pipe with a 1-in. wall, extended their full 195-ft height. But because of its size and weight, only the lower 160 ft of each permanent caisson was set in its jacking ap-

(Continued on page 144)

This heavy-duty pavement puts emphasis on flexibility

Laying the top course of a 3-inch hot-mix Texaco Asphaltic Concrete surface on a divided highway in southern New Jersey.

Surface
3 inches of hot-mix Texaco Asphaltic Concrete, laid in two courses.

Base
4 inches of waterbound macadam.

Sub-base
5 to 8 inches of gravel.

The all-flexible pavement constructed on this heavily traveled New Jersey highway has an important advantage, which pays off in greater durability and lower upkeep. Thanks to its top-to-bottom flexibility, it maintains contact with the subgrade continuously and completely. Consequently it is never without the full support of the underlying soil.

The all-flexible design used for the highway in the photograph called for a waterbound macadam base. On other important traffic arteries, either hot-mix Texaco Asphaltic Concrete or Texaco Asphalt (penetration) Macadam has been employed as the base course, according to the volume and weight of traffic to be served.

Using Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils, the road builder has a choice of many heavy-duty, intermediate and low-cost types of construction for streets, highways, airports, parking areas, etc. Helpful information concerning all of these types is supplied in two free booklets which can be obtained without obligation by writing our nearest office.

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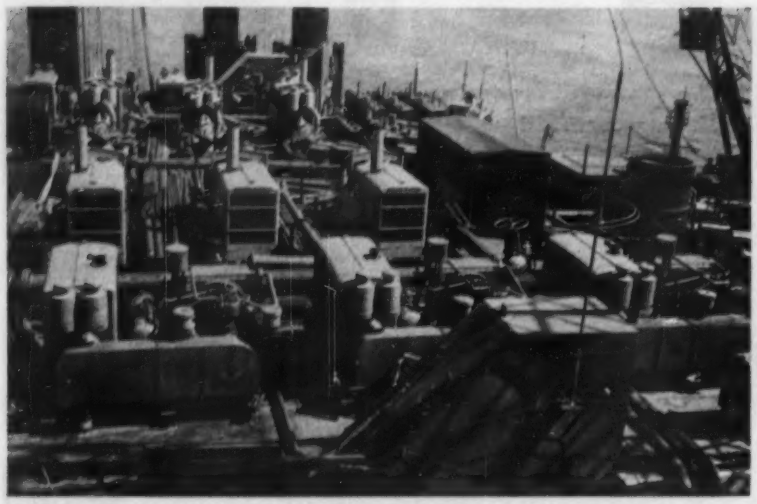
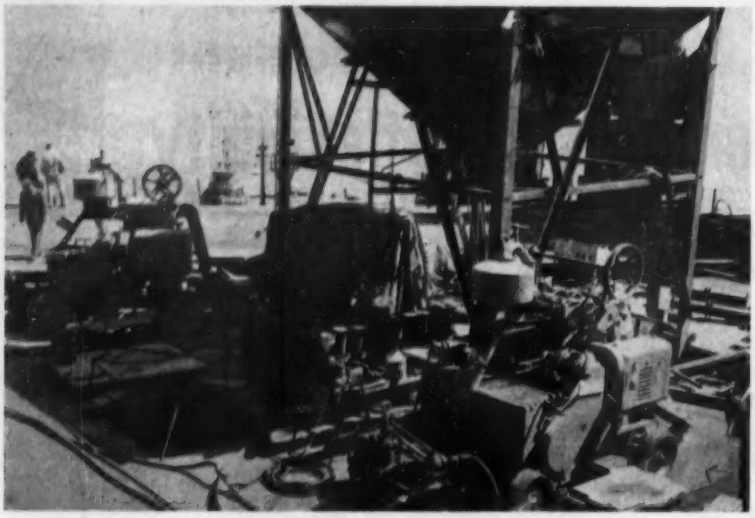
TEXACO

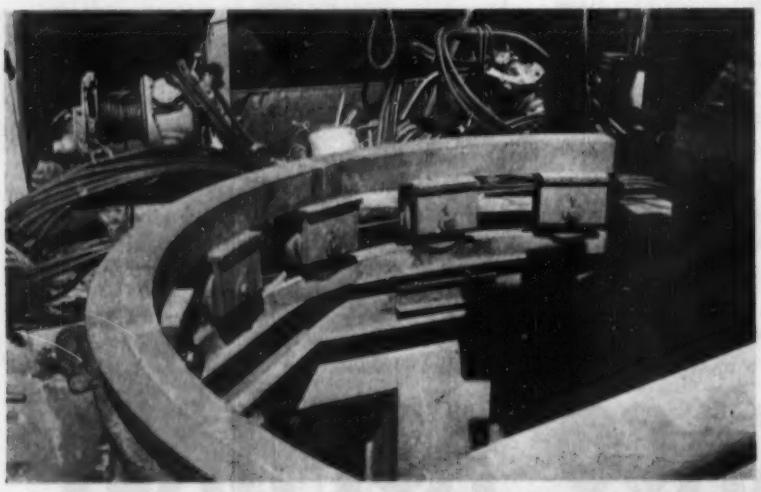
TEXACO ASPHALT



CONSTRUCTION MACHINES crowd platform deck. They include six Gardner-Denver 400-cfm compressors, 12 Lincoln 400-amp welders, generators, high-pressure jet equipment.



CONCRETE EQUIPMENT for 1,730 cu yd of Prepakt-Intrusion mix that goes into legs includes two Koehring Dandie mixers, Gardner-Denver grout pumps, Erie bin, Winslow scale.



SUPPORTING RING that holds jetting apparatus rolls around frame on top of caisson. Two Ingersoll-Rand air tuggers (rear) turn it so jet sweeps around inside of cutting edge.

paratus; the remaining 24-ft lengths were carried on deck.

Thus prepared, the platform was towed to its erection site by two 1,800-hp Moran tugs, each hooked to a 2¼-in. steel link chain bridle. It was an awkward tow: The 200-ft triangular structure weighed 6,000 tons and drew 12 ft of water. Yet the 155-mi voyage was made at almost 3 knots.

When the hull had been correctly positioned and oriented, it dropped its 12 temporary caissons and started jacking its way upward. Seven hours later the platform was slightly above water. Then the three permanent caissons, which totaled more than 1,000 tons, were lowered to reduce the load on the jacks.

Jacking was resumed until platform deck neared the top of the permanent caissons, then their 24-ft extensions were welded on. Continued jacking raised the platform to planned deck height of 87 ft above mean low water. (Final penetration of the 6-ft temporary caissons was between 5 and 10 ft.)

Then the space between permanent caisson tip and its surrounding 15-ft dia shell was filled with Intrusion-Prepakt concrete (except for the bottom 14 ft at the cutting edge, which had been poured in Boston).

Jet, Muck and Jack

Permanent caissons were next sunk, one at a time. Sinking procedure was a combination of jetting, excavation and jacking.

Jetting inside the caisson was done with a 12-in. pipe whose foot carried six 1⅛-in. nozzles set to flush horizontally as well as diagonally downward. The jetting assembly was supported by beams spanning a movable ring whose wheels rode around the top of the caisson. The ring was rotated back and forth, much like a bull wheel, by wire-rope wrappings powered by two air tugger hoists.

The jet was offset so it hung near the caisson wall. Thus, as it traveled around, it cut sand directly from inside the cutting edge and allowed the caisson to sink plumb.

To lubricate the skin of the caisson to facilitate sinking, 32 small jets had been installed in the space between 10- and 15-ft shells. These extended through the latter and flushed upward. They were arranged in two levels (14 and 26 ft above cutting edge) and were hooked up in units of four in each

(Continued on page 146)

Fast, efficient Whiteman Power Buggies poured 33,000 yds. of concrete on bridge, running on movable platforms.

Double walers are hauled to front of forming operations on Whiteman flat bed Power Buggies to speed job.

Here a Whiteman Power Buggy pulls a trailer load of reinforcing bars from supply depot on bridge to forming crews.

Portable runways were built ahead over mall to let Buggies deliver materials anywhere. Here a Buggy hauls a roller.

big bridge job proves

VERSATILITY

of Whiteman

POWER BUGGIES

Building New York's three mile long, six lane Tappan Zee bridge in record time was possible to a large extent through the ingenious use of 14 Whiteman Power Buggies. These fast, rugged, tireless workers not only placed 33,000 yards of concrete, but proved their amazing versatility by also hauling lumber, forms, reinforcing steel, and innumerable other materials . . keeping the job rolling at a speedy pace.

Consider the many material-handling jobs that Whiteman Power Buggies can do for you faster, more efficiently, more economically. Three body types for various needs. Or we will design a special body to meet your particular requirements. Call your Whiteman distributor or send coupon today.

Joint general contractors for the rock work: Grandlone Construction Co., West Shore Concrete Co., and Euclid Contracting Corp. Whiteman Power Buggies supplied by Contractors Supply Corp. Photos courtesy Construction Methods & Equipment.

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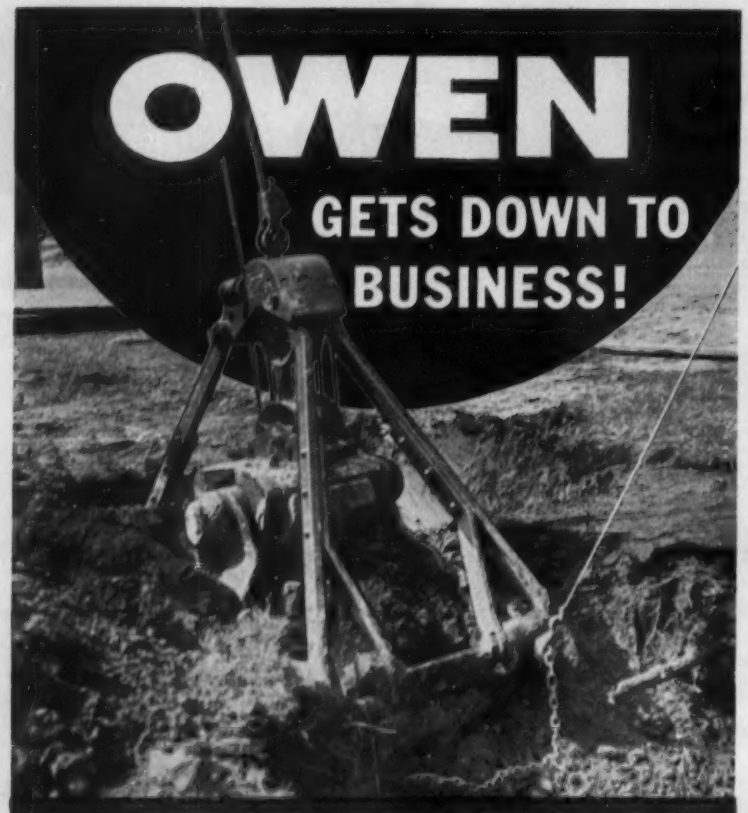

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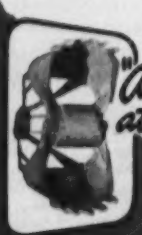


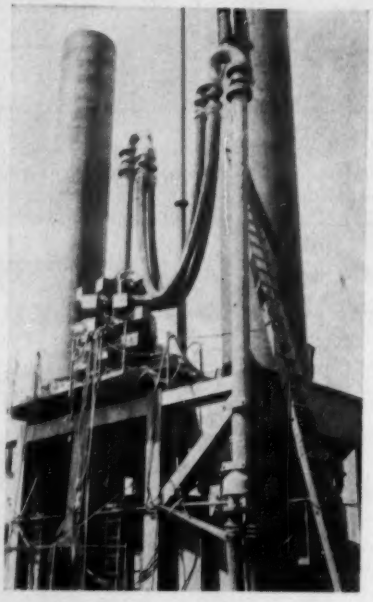
"A mouthful at every bite"

OWEN CLAMSHELL BUCKETS
BIGGER DAYS WORK

THE OWEN BUCKET CO.

SEA-GOING RADAR TOWER . . .

Continued from page 144



JET ASSEMBLY is blocked to top of caisson leg as latter sinks into bottom. Three 5-in. hoses with Chicksan swivel couplings take water from header to jet.

level for selective jetting as needed.

All jetting water was brought from the sea to deck level by three Peerless deep-well pumps (each rated 1,800 gpm at 110-ft head) driven by General Motors 6-71 diesels. These fed water into a 12-in. header. From here it was sucked by six Griffin high-pressure jetting units (each rated 1,400 gpm at 350 psi) and pushed through another 12-in. line to the jet. Material put into suspension by the main jet was dredged out by a 6-in. sand pump powered by 200-hp electric motor. This dredge assembly was hung in the caisson by a crane.

During jetting and excavation, downward jacking force was transmitted to the permanent caisson by a cross-bridge pinned to it. Each end of this yoke was pushed by a DeLong jack that rode a 6-ft dia stub caisson welded to the platform deck. The jacks were adjusted to exert just enough down pressure to keep the caisson cutting edge in firm material. This prevented any wasteful inflow of sand beneath it from outside.

In this manner, the first permanent caisson was lowered 34 ft in 6 hr. But then the sand pump went sour. So the caisson was taken

(Continued on page 149)

Wire Rope at Work—Probably many residents of Spokane, Wash., remember scenes like the one above, photographed while the new Coliseum was under construction. Now those curved steel beams support the roof of the finished structure, whose main enclosure is approximately 210 ft long by 125 ft wide. The largest civic auditorium in the Pacific Northwest, the Coliseum can be used for stage and trade shows, conventions, ice-skating, basketball, boxing, and other indoor activities.

Bethlehem wire rope, flexible and strong, was active during the building. Its chief job, of course, was the lifting of heavy loads, including the many roof beams. This it took in stride, performing reliably as always, and helping the steel-erection work to progress with unusual speed. A typical assignment for Bethlehem rope, which is at home on any type of construction project, large or small.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • MINING • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

(Advertisement)

5 SUPERIOR WAYS OF HANGING FORMS FROM STEEL BEAMS AND GIRDERS

(NOT FIREPROOFED)

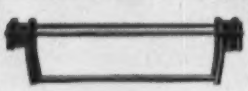
Especially designed to meet field conditions on BRIDGE SUPERSTRUCTURES

Standard Coil Hanger Frame

When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts is 10,000 lbs., or 5,000 lbs. per bolt.

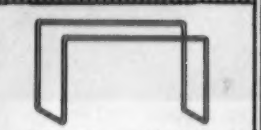
Plate Hanger Frame

The Plate Hanger Frame, shown at left, has metal plates with a punched hole instead of wire coils. The Coil Bolts are passed through the holes and secured from above with coil nuts. The plates provide adequate bearing for the nuts, which being square will not turn when the bolt is removed. The installation and necessary adjustment to bring the deck forms tight against the flange are from above the deck. The total safe load on both coil bolts is 10,000 lbs., or 5,000 lbs. per bolt.

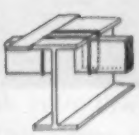


Special Hanger Frame

The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch on the upper flange, which varies in depth. Superior *Special* Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" Coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail at left.) Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt .

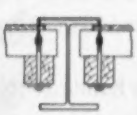


Wire Beam Saddle



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

Coil Beam Saddle



Superior Coil Beam Saddles are used, as shown at left, where hanger wires may be cut after stripping the forms. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

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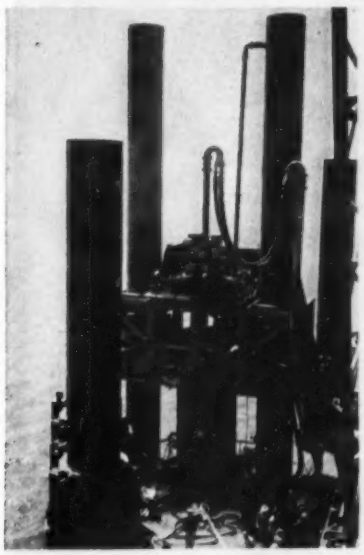
SEA-GOING RADAR TOWER . . .

Continued from page 146



JACKING YOKE, which helps to sink tower leg, carries two DeLong jacks that ride down two stub caissons welded to the deck.

down the remaining 14 ft by clamming from within with a 1-yd bucket. The other two permanent caissons were also mucked out by clamshell. Sinking progress by this method, of course, was not nearly so fast as when the sand pump was used.

All three caissons are now at grade and welded to the platform. Concreting of 41-ft seals to plug the bottom of the caissons is underway. When this is finished, caissons will be dewatered, a 6-ft dia pipe placed lengthwise in each, and the 2-ft ring between it and the caisson shell concreted.

With the tower's leg thus structurally complete, the 12 temporary caissons and their brackets can be removed. Miscellaneous work on the platforms and installation of equipment will ready the tower for its vital defense mission.

Contractor building Texas Tower No. 2 is a joint venture of Raymond Concrete Pile Co. and DeLong Corp., both of New York City. George F. Tait, a DeLong vice-president, is project manager. Raymond's representative is Gordon A. Fletcher, assistant vice-president. H. C. Duncan is project engineer, J. D. Bush, Jr., is construction manager, and George Bauer is superintendent. The Navy's Cdr. J. J. Albers is officer in charge of construction for the Department of Defense.

New "geodetic suspension" provides two-way protection

It has been proved that most fatal head injuries are caused by shock to the brain rather than injury to the skull. As a result, Cornell Aeronautical Laboratories patented this new type suspension for industrial safety hats.

This new feature is available only in WILLSON "SUPER-TOUGH®" SAFETY HATS AND CAPS.

It affords extra comfort as well as maximum protection . . . *inside and out!* For example, a blow no longer concentrates its force on a small area at the crown of the head. Instead, "geodetic" crown straps are so located that the force of the blow is dispersed over the entire head area!

Moreover, a pneumatic cushioned sweatband makes the tough Fiberglas hat shell safer—more comfortable, too, because a series of metered, inter-connected air cells team up to absorb the force! Get complete details. Send coupon below for latest bulletin.

Clip and mail coupon for latest head safety information.

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EIMCO TRACTOR

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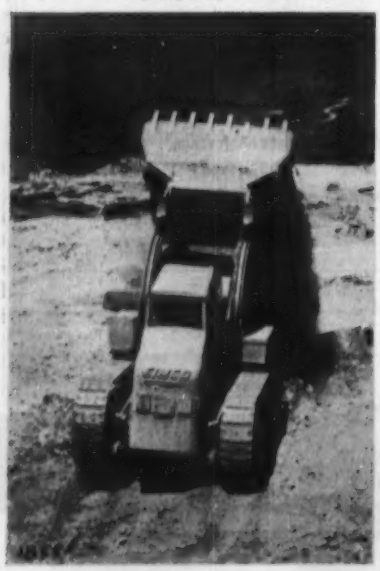
Excavating for the crusher station at this new metallurgical instalation, the Eimco 105 does an outstanding job and the operator says "It's . . .

...The Muck Eatinest Machine..."

Rare Metals Corporation will soon complete its new 200 ton mill on this cinabar property and when completed this will be the largest single rotary kiln on mercury in the world. This property uses its Eimco 105 Tractor-Excavator for many different jobs on the project and in the operation pictured above the Eimco is digging out the bank of sand and rock to build a level area for the primary crusher site. The operator digs in, gets a good bucketful and trams back about 50' to discharge over the embankment. **Two round trips with full buckets are made every minute. This gives him 3 yards a minute with about 200 feet of travel or at the rate of 180 yards per hour with more than 2 miles of travel."** The operator notes that the Eimco is very easy to operate and says, **"It's the muck eatinest machine I ever saw — I can move 15 ton boulders with it."**



The 105 discharges rock over embankment. Digging in rock is easy for Eimco 105 Tractors with Excavator attachments. These are the only tractors built for this type of operation as standard construction.

Eimcos are made to dig rock — or any other hard abrasive material and maintain their digging efficiency week after week and month after month.

The **operational superiority** of the Eimco Tractor cannot be fully appreciated by anyone until he has actually run the machine, the **constructional superiority** of the Eimco Tractor cannot be fully appreciated until he visits the plant and sees for himself the rugged, heavy construction, precision manufacture and skilled assembly of Eimco 105 Tractors.

Eimco invites you to visit their plants, see for yourself and compare piece for piece the components of this tractor with corresponding parts on any other tractor.

THE EIMCO CORPORATION
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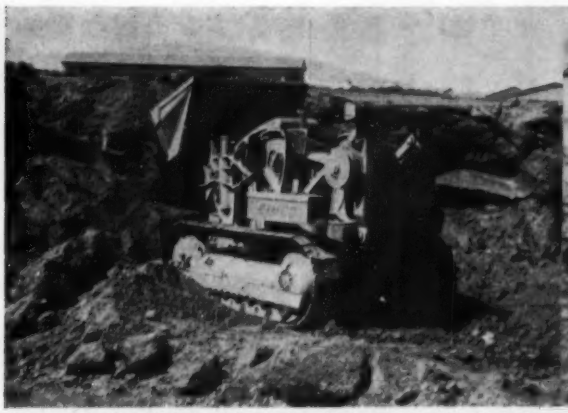
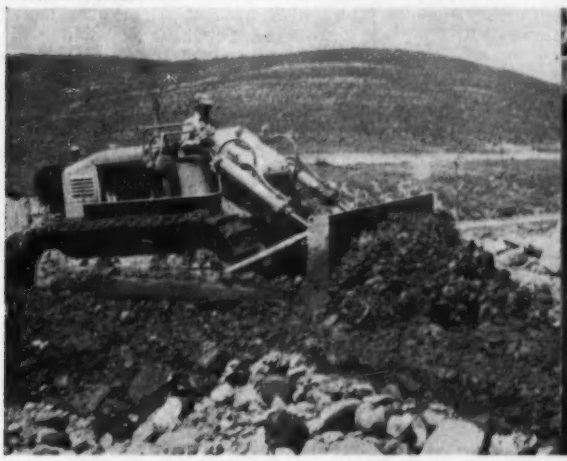


Eimco 105 Tractor-Excavator digging in laterite at Elizabethville in the Belgian Congo on a Public Works roads project. An inexperienced operator will do a creditable job after only a few minutes instruction.

Pit excavation on a selective basis is done faster and cheaper with Eimco Tractor-Excavators than any other method. Let an Eimco engineer tell you how to save in open pit operations.



Eimco Tractors are the only tractors giving the operator full visibility of the job being done. Foam rubber cushions and conveniently arranged handles mean that hands never have to be moved from lever to lever to accomplish any movement of tractor or hydraulic blade.

Removing overburden at an African copper mine — open pit project. Digging depth stops permit digging to 17" below grade after the desired grade has been obtained the stops are set back to level digging to maintain slope.

Lugging power in the Eimco 105 Tractor is greater than that available in many conventional tractors. Eimcos were FIRST to offer torque converters on all machines as standard equipment — FIRST with power shift transmissions.

Fast Loading — Eimcos have a 10-12 second loading cycle. When trucks are kept up close, loading speeds of 300-350 yards per hour can be maintained, in average digging materials.

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EIGHTH IN A SERIES OF ARTICLES ON COMMON MAINTENANCE PROBLEMS

Know Your Proper Drain Schedule

Selecting the proper drain schedule for your diesel engine is essential for long engine service between overhauls.

Some authorities point out that oil does not wear out, and some say it is wasteful to drain oil at all. Engine manufacturers are more conservative and recommend specified drain periods under certain conditions. We would like to point out some facts about when to change oil that have been obtained from many years of experience in servicing customers with heavy-duty equipment in all parts of the country. Our purpose in giving this information is a matter of service to our customers, to enable them to receive good engine performance.

The main reason why oil should be changed is because, in service it becomes so heavily contaminated with by-products of fuel combustion and road dust that it can no longer keep engines clean or prevent excessive engine wear. When fuel burns, sooty carbon, varnish, asphaltenes, acid, water and fuel dilution are formed and contaminate the engine oil. In other words, a diesel engine is essentially a chemical plant. The "products" of the chemical plant are the by-products of combustion.

If the fuel burns clean, with clean exhaust, there is less contamination of the oil. For example, in a butane engine or slow-speed diesel (less than 350 RPM), there is very little contamination of the oil and long drain periods are practical. However, in the high-speed diesel, the fuel does not burn as clean, higher engine temperatures are present, and more contamination of the oil occurs. If an engine is overloaded, a maximum amount of fuel is injected, while there is no increase in available air. This causes incomplete combustion with excessive oil contamination and shorter oil drain schedules are necessary.

Other factors, which cause excessive contamination, are as follows:

1. Ambient temperatures below 10° F. or above 100° F.
2. Loading above 80 per cent of engine capacity.
3. Idling engine below 15 per cent of engine capacity.
4. Sulfur content of fuel above 0.4 per cent.
5. Supercharged design.
6. Dusty operations.

One hour of operation, after the oil has been completely contaminated, can cause more deposits or wear than 10,000 miles or 300 hours of normal operation.

If your engines have clean combustion, you can use the oil for a maximum drain period. If you don't have clean combustion because operating factors mentioned above prevent it, we highly recommend shorter drain periods than normal. Oil is cheap as compared to an engine overhaul. To operate an engine, one spends less for oil than for fuel, operator or maintenance; yet the use of a quality oil, with proper drain schedules, is the most important factor in obtaining good engine performance.

A quality oil with more alkalinity will prevent engine wear for a longer period of time, even with high sulfur fuel. A quality oil has more detergency which will hold more fuel combustion products and prevent engine deposits for a longer period of time. Even though it is safer to use a quality oil for longer drain periods, it is wise to base your drain schedule on operating conditions. If there is any doubt as to whether or not your oil has been used too long, send a sample of used oil to our Laboratory for a complete analysis. This is the only sure way of knowing the true condition of the used oil. We maintain this free service for our customers.

D-A lubricants are sold and serviced from coast to coast. Write for the name of the D-A representative nearest you.

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SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

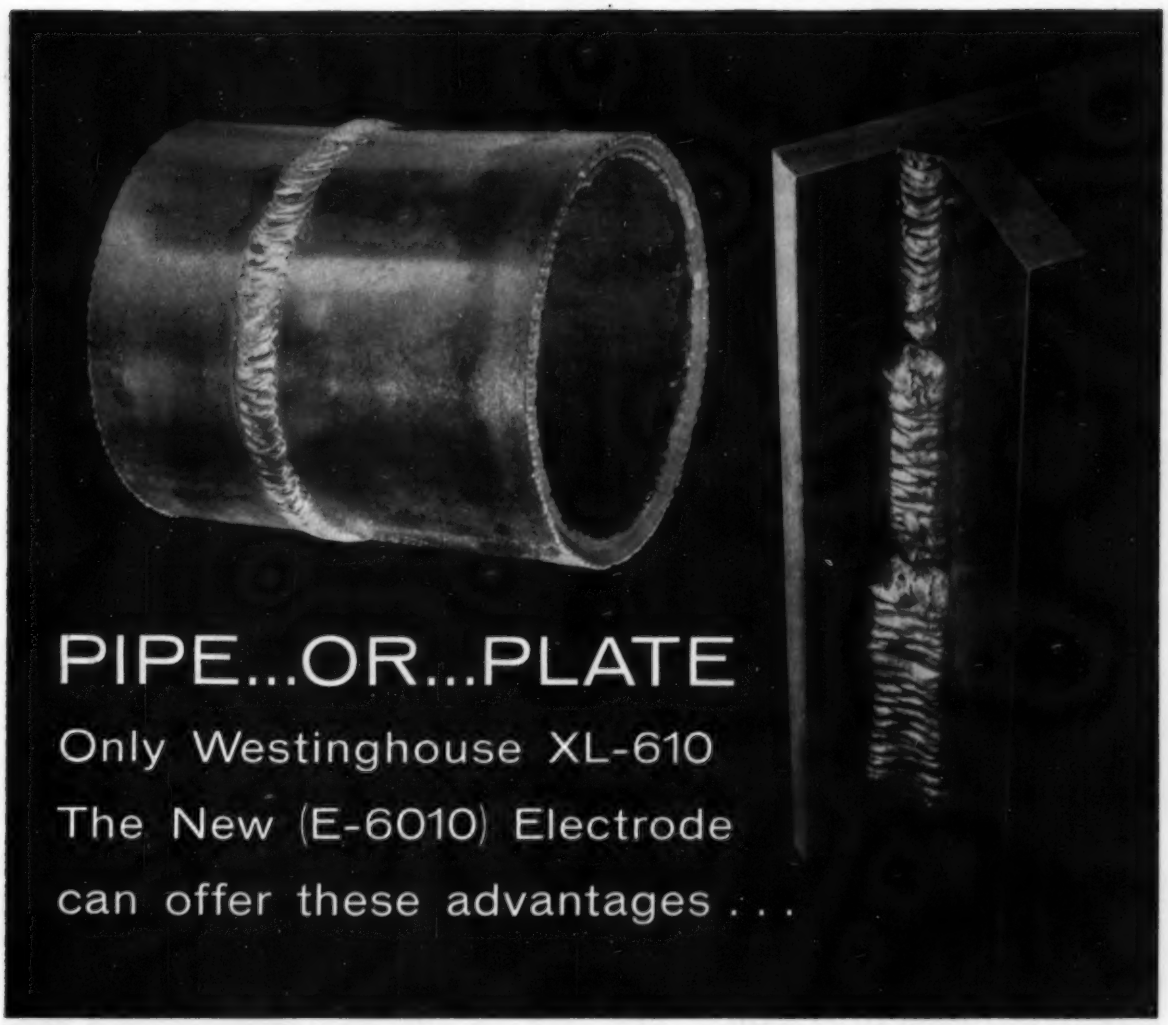
Galion Allsteel Body Co.: Atlas Truck Equipment & Bus Co., Milwaukee, have been appointed distributors for Galion Allsteel hydraulic hoists and dumpbodies. Their territory will cover Wisconsin and the Upper Peninsula of Michigan. Galion has also appointed Transportation Equipment Co., East St. Louis, distributors for all products in southern Illinois and eastern Missouri.

LeTourneau-Westinghouse Co.: G. C. Phillips Tractor Co., Inc., 4419 First Ave., N., Birmingham, Ala., has been named distributor for LeTourneau-Westinghouse and Adams products for Northern Alabama. G. C. Phillips is president of the 31-year-old firm.

Clark Equipment Co.: Twelve new dealers have been appointed to sell and service the Michigan line of tractor shovels and excavator cranes. They are: R. C. Larkin Co., Chicago, Ill., for parts of Illinois and Indiana; Lake Shore Engineering Co., Duluth, Minn., for 11 Minnesota counties; Highway Equipment and Supply Co., Harrisburg, for 29 Pennsylvania counties; Shelton-Witt Equipment Corp, Roanoke, in the Virginia counties west of and including Augusta, Nelson, Appomattox, Campbell and Pittsylvania; Mitchell Distributing Co., Inc., Raleigh, to handle only Michigan tractor shovels throughout the state; Reagan Equipment Co., Birmingham, to handle Alabama; Western Construction Equipment Co., Billings, to handle only Michigan tractor shovels in eight Montana counties; Moss Equipment and Supply Co., Casper, for all but four Wyoming counties; Columbia Equipment Co., Portland, for all counties of Oregon except four, and in parts of Washington; Evans Engine and Equipment Co., Inc., Seattle for Alaska; and J. H. Ryder Machinery Co. Ltd., for Winnipeg, for the province of Manitoba, Canada.

Wooldridge Earthmoving Equipment: Cyril J. Burke Inc., Detroit, Mich., has been named distributor throughout the eastern half of the lower peninsula of Michigan for Wooldridge earthmoving equipment, the Wooldridge Manufacturing Div. of Continental Copper & Steel Industries, Inc., has announced.

(Continued on page 155)



- Pinhole-free, x-ray quality welds in any position. Fewer rejections, faster production, better quality work.
- Feather-touch slag removal—cleaning time reduced to an absolute minimum.
- Deep penetration for root pass welds. Makes XL-610 especially suited to heavy plate fabrication, pipeline, shipyard, pressure vessel and construction work.
- Extremely low spatter loss, even with high currents. Higher deposition rates, easier cleaning.
- PLUS these exceptional "physicals". . .

J-21911

YOU CAN BE SURE...IF IT'S Westinghouse

ABS Specifications	Westinghouse XL-610		
	5/32"	3/16"	1/4"
Percent elongation in 2" . . 22%	28	28	34
Yield strength, psi 50,000	52,900	54,800	53,800
Ultimate strength, psi . . . 62,000	65,900	64,500	62,400

WESTINGHOUSE ELECTRIC CORPORATION
Welding Dept., Box 868
Pittsburgh 30, Pa.

Gentlemen: Please rush full information plus samples on new Westinghouse XL-610.

Name_____ Title_____
Company_____
Street & No._____
City_____ Zone____ State_____

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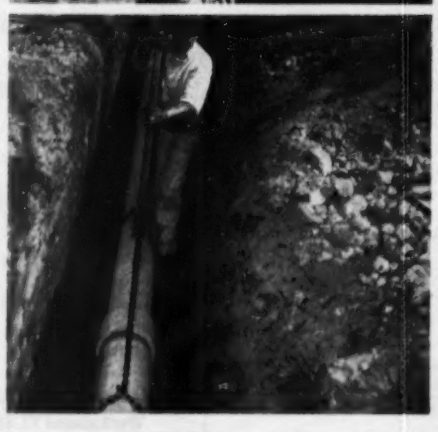
Installed cost plus performance is what counts!

That's why it pays to use Transite® Pressure Pipe with the Ring-Tite® Coupling

FOR THE contractor who installs it . . . for the engineer who selects it . . . for the taxpayer who pays for it . . . Transite Pressure Pipe with the new Ring-Tite Coupling meets every requirement. For example . . .

Installed Cost is Lower—Contractors everywhere have found that Transite's light weight, easy handling and fast, accurate Ring-Tite Coupling simplify assembly and save time. May be installed even under difficult weather and terrain conditions. The Ring-Tite design automatically locks tight, forming a positive seal.

Performance is Higher—With Transite Pressure Pipe and the Ring-Tite Coupling, you can count on peak performance year after year because of such engineering advantages as these: *Lasting* strength because of Transite's asbestos-cement, a strong durable material, highly resistant to corrosion . . . *Designed* tightness with the rubber rings of the Ring-Tite Coupling . . . *Assured* flexibility with automatic end positioning within the joint . . . *Locked in the groove* . . . rings can't blow out.



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Johns-Manville TRANSITE PRESSURE PIPE

WITH NEW RING-TITE COUPLING

SALES AND SERVICE . . .

Continued from page 152

Baldwin-Lima-Hamilton Corp.: The Construction Equipment Div., has appointed two distributors in the South. General Machinery Corp., 1227 Marietta St., Northwest, Atlanta, Ga., has been named distributor of Lima shovels, cranes, draglines, pull shovels and Austin-Western crushing equipment in an area covering the northern portion of Georgia with the exception of five extreme northwestern counties. Aldridge-Harbour Equipment Co., Inc., West Jackson Station, Jackson, Miss., will cover the southern half of Mississippi.

Pioneer Engineering Works, Inc.: Neff Machinery, Inc., Miami, Fla., has been appointed distributor in Southern Florida for the Continuflo line of mineral and aggregate processing equipment and bituminous mixing plants. P. A. Neff is president and sales manager of the firm.

Harvey Aluminum: Two Los Angeles firms, Baker Steel & Tube Co., and Continental Metals, Inc., have been appointed distributors stocking a full range of sizes and alloys of aluminum tubing. Benjamin Metals Co. continues as western distributor for Harvey Aluminum rod, bar, structural shapes and tubing.

LeTourneau-Westinghouse Co.: Ferguson-Blakemore Machinery Co., East Oakland, Calif. has been named distributor for this company's complete line of equipment including motor graders and TraveLoaders manufactured by its Adams Division. The newly organized distributorship is headed by E. M. Ferguson and John Blakemore.

Brush Aboe, Inc.: The Petter Diesel Engine Div. announces the appointment of two new distributors to represent them in Florida. Neff Machinery, Inc., 2601 N.W. 5th Ave., Miami, will concentrate on the sale of Petter industrial engines, while Southern Diesel Sales, 529 Palm Beach Blvd., Fort Myers, will cover the marine range.

Cooper Alloy Corp.: The appointment of John Wilfert Co., Brooklyn, N. Y., as authorized distributors for Cooper alloy valves, fittings and accessories has been announced. The company serves New York and New Jersey, as well as a considerable foreign market.

Nelson Stud Welding Div., Gregory Industries, Inc.: George E. Kennedy has been appointed architectural representative on the west coast. He will work directly with architects and engineers in the development of designs and specifications incorporating the Nelson fastening method.

The Galion Allsteel Body Co.: Appointment of V. W. Weeks & Sons, Inc., Glens Falls, as distributors of Galion Allsteel dump bodies and hydraulic hoists in east central New York, has been announced. The new distributor offers modern hoist and body installation facilities, plus complete parts and maintenance service.

Baldwin-Lima-Hamilton Corp.: Construction Equipment Div. announces two distributor appointments: Hawkeye Machinery Co., Inc., Des Moines, Iowa, has been named distributor of Lima shovels, cranes, draglines, pull shovels and Austin-Western crushing equipment, covering the central and eastern portion of the state of Iowa. Bert Smith Road Machinery Co., Inc., Enid, Okla., has also been assigned the Lima line, covering the state of Oklahoma with the exception of six extreme eastern counties.

Bucyrus-Erie Co.: Euclid-Memphis Sales, Inc., Memphis, Tenn., now offers sales and service on Bucyrus-Erie excavators and cranes in western Tennesee, northern Mississippi, and northeastern Arkansas.

POWER to MIX Concrete and DELIVER it...BOTH UNITS ARE

WISCONSIN-POWERED

Working here are two fine units powered by Wisconsin Heavy-Duty Air-Cooled Engines . . . the versatile "Scoot-Crete" made by Getman Brothers, Manufacturing Div., South Haven, Mich., and the Kwik-Mix Dandy, built by Kwik-Mix Co., Koehring subsidiary, Port Washington, Wis. Both of these units have the inbuilt stamina and Lugging Power that are Wisconsin Engine characteristics . . . insured by such features as:

Heavy-duty engineered design and construction in all details; self-cleaning, file-hard tapered roller bearings at BOTH ends of the crankshaft; an easily accessible rotary type, high tension OUTSIDE Magneto, equipped with Impulse Coupling for quick starts in any weather, at low cranking speeds; pump circulated splash lubrication on smaller models and geared oil pump delivering individual oil stream to each rod on multi-cylinder models, *plus* efficient AIR-COOLING at temperatures from sub-zero to 140° F.

All this adds up to efficient Power Performance, Long Engine Life and Low-Cost Maintenance . . . reasons why *you* can't do better than to specify "Wisconsin Power" for *your* equipment.

Single-cylinder 3 to 9 hp. models.

2-cylinder 7 to 15 hp. models.

V-type 4-cylinder 15 to 36 hp. models.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

You Have The World's Best Laboratory for Testing Hoists

Specifications are helpful guides in choosing the right hoist for your job. Factory tests give further assurance. But the hoists on your own job hold the key to your wisest final choice. These hoists have been tested in the world's best laboratory for your purposes. They have been operated by *your* men under *your own* exacting conditions. Their performance takes the guesswork out of choosing.

That's why Coffing Safety Pull Ratchet-Lever Hoists are standard in so many plants. Their record of durability and safety for more than 25 years under actual job conditions puts them in a class by themselves as the wise choice.

Examine the hoists in *your* "laboratory." Which is the oldest one in good working condition? When safety is vital, which hoist do your men use? We believe the answer is Coffing — the *original* ratchet-lever hoist. If you would like more information on the complete line of Coffing Ratchet-Lever hoists, write for catalog D-SP.

COFFING

Quik-Lift Electric Hoists
Hoist-Alls • Mighty-Midget
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There's EXTRA PROFIT for you with this new

faster arc welding

Eliminates costly shut-downs, delays and expensive replacement parts. Keeps equipment working by making repairs right on the job.

Heavy Duty Gas Drive DC Arc Welder, with many combinations of auxiliary power

Speed up your work by having your own Hobart Gas Engine Drive Arc Welder right on the job. Do your own steel erection, reinforcing or repair work without costly delays. Fabricate steel or make emergency repairs anywhere on a moment's notice. No need for power—a Hobart self-starting welder works independent of power source . . . and there's a size and type for every job.

For extra heavy duty welding, many contractors favor the Hobart DC Gas Drive Welders that range from 300, 400 to 600 amp. capacities.

Other contractors like the combination AC Power–AC Arc Welder that furnishes power for welding or runs lights, tools, motors, etc., wherever and whenever it's needed.

The lightweight, easy to move "Contractor Special" is being found more and more on construction, pipeline, maintenance work. It gives "on the job" welding at low cost with a hot fast dependable arc. Has 1 KW DC auxiliary power for operating lights, tools, etc.

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For type of work_____

NAME_____ POSITION_____

FIRM_____

ADDRESS_____

SALES AND SERVICE . . .
Continued

Cummins Engine Co., Inc.: The appointment of a Cummins distributor for the entire territory of Alaska has been announced. Headquarters for the new distributor, called the Cummings Diesel Sales of Alaska, Inc., will be maintained at E. 5th Anchorage, Cummins also announced the formation of a distributorship for Michigan and the seven counties in Northern Ohio. L. W. Childs, president, and J. S. L. Shales, vice president, head the new outlet, which is to be located at 3601 Gratiot Ave., Detroit.

On the Sales Front

Lincoln Engineering Co.: Joseph J. Jenkins has been appointed sales manager, Industrial Division after 15 years with the company.

H. K. Porter, Inc.: Harry M. Webster, previously sales manager of the Cutter and Industrial Division, has now been promoted to sales manager of trade sales, in charge of all cutter, pruner, and automotive trade sales.

Peerless Pump Div., Food Machinery and Chemical Corp.: C. Scott Hoeppner has been named San Francisco branch manager of the Peerless Pump Div.

O. Ames Co.: E. B. Thompson, former Mid-Atlantic division sales manager of McGraw Electric Co., has been named merchandising manager of the O. Ames Co., Parkersburg, W. Va., a division of the McDonough Co.

Cummins Engine Co., Inc.: B. C. Sears, former regional manager for the Rocky Mountain region, has been named regional manager for the Great Lakes region. His office will be at Cleveland, Ohio.

Marion Power Shovel Co.: William H. McAllister, Kansas City, Mo., has been named district manager for a 5-state area embracing Kansas, Oklahoma, Nebraska, Colorado and the western half of Missouri. Mr. McAllister formerly was in charge of the sale of Marion machines in the Dallas, Tex., area.

Gould-National Batteries, Inc.: W. D. Thomas has been named manager of fleet sales for the West Coast region. For the last three years he has been Chicago regional sales manager of Gould-National.

Dayton Pump and Manufacturing Co.: Frank G. Hickey, formerly Northern regional sales manager, has been made assistant sales manager. James F. Pease continues as field sales manager in charge of the company-employed sales force. Rich-

(Continued on page 159)

(Advertisement)

Dutcher Construction teams C & D Movalls with Caterpillar DW21's to dump gluey marine clay quickly and cleanly on St. Lawrence Seaway.

MOVALL'S POSITIVE EJECTION SCRAPES OUT GLUE-LIKE CLAY ON SEAWAY JOB

MORE LIKE GLUE THAN CLAY—that's how observers described the sticky, blue marine clay on Dutcher Construction Company's Grasse River Locks project near Massena, N. Y. Gravity alone couldn't discharge this sticky clay from bottom-dump and tilting end-dump wagons. It came out of scrapers in big lumps which blocked the scraper wheels.

After considering all types and makes of hauling units, Don Dutcher put nine C & D Movalls, powered by Caterpillar DW21's on the job. Here's what he says of his choice:

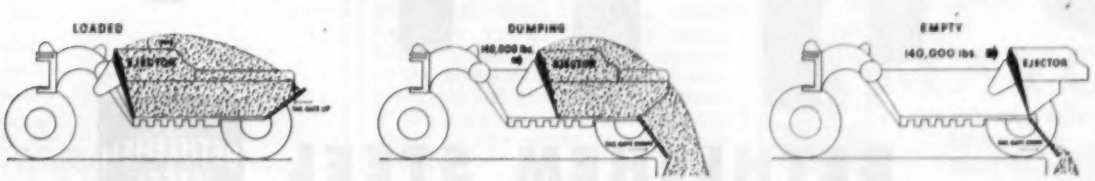
"I selected Movalls for my job on the St. Lawrence Seaway because I figured the positive ejection features would handle the sticky material here better than any other hauling unit. The MOVALLS will also handle rock and any other type of material I'll have to haul. I like the easy interchangeability from Movall to scraper use. The Movalls are doing a wonderful job, and I am very happy with them."

DOZER-LIKE EJECTOR with 140,000-lb. push wipes the Movall body clean every trip (no build up as with gravity dump); handles any material you can top load, enables you to control dump and spread, when needed.

BUY AND TRY FROM CATERPILLAR DISTRIBUTORS—C & D Movalls of 31 tons, 25 heaped yards capacity are available NOW for DW20's, DW21's; also 22 tons, 16 heaped yard Movalls for DW15's. Ask your reliable Caterpillar-C & D dealer to demonstrate on your job, or write direct to C & D Manufacturing Company, Perkins (suburb of Sacramento), California. Phone HIllcrest 5-8592.

6

HOW IT WORKS—*Movall uses standard cable scraper power control. To dump, operator releases backhaul drum to drop tailgate, engages ejector drum. Eight-part ejector line gives 140,000 lb. push to boost load out fast and clean. Operator has complete control of discharge, controls spread depth by varying travel speed. After dumping, backhaul line closes tailgate and rolls ejector to loading position.*



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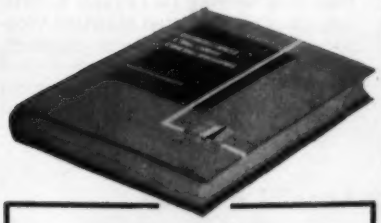
BETHLEHEM STEEL

BETHLEHEM STEEL



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Thorough treatment of public water supply, also including private and industrial supplies. Discusses all phases of the subject necessary to complete waterworks planning and design—financial and administrative principles, estimating usage, computing surface runoff and ground-water supplies, hydraulics of flow, materials and their use, pumping stations, etc. Includes extensive treatment of water purification. **By H. E. Babbitt, San. Eng., and J. J. Doland, Prof. of Hydraulic Eng., Univ. of Ill. 5th Ed. 675 pp., 257 illus., $8.50**

CIVIL ENGINEERING HANDBOOK

New 3rd Edition bringing you up to date on fundamentals, theory, and practice of various subdivisions of civil engineering. Covers surveying—railway, highway, and airport engineering—mechanics of materials—hydraulics—stresses in framed structures—steel design—cement and concrete—foundations—sewage disposal—water supply and purification. **C. Urquhart, Editor-in-Chief. 976 pp., over 900 illus., $11.00**

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A sound guide to modern methods in producing and using concrete. Every important phase of concrete technology—from preparing specifications to supervising construction, and testing concrete and concrete materials—is fully covered. Includes best practices in proportioning, making, placing, finishing and curing concrete.

When you run into an unfamiliar situation — when you want to check a specification, etc., refer to this guide and find the right answer quickly and easily. **By E. Bauer, Assoc. Prof. of Civil Engr., U. of Ill. Third Edition, 441 pp., $7.00**

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A practical book that shows you how to estimate construction costs quickly and accurately. Gives step-by-step instructions for estimating construction work of all kinds, including excavations, all parts of buildings, concrete, structural steel, and material transportation, etc. Explains every phase of the work—from preliminary investigation, through complete, detailed estimates that include overhead, cost of plant, profit, and so on. Includes many illustrative, worked-out estimates of typical jobs. **By Harry E. Pulver, Prof. of Civil and Structural Engineering, Univ. of Wisconsin. Second Edition. 653 pp., 287 illus., and tables, $8.00**

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SALES AND SERVICE . . .

Continued from page 156

ard B. Evans, formerly sales office manager, will become district representative in the Ohio-Indiana territory. Donald Paulson will take over O. E. M. and contract sales in addition to his responsibilities as service and training manager.

Koehring Co.: Howard H. Mobley is the new district representative for distributorships in Illinois, Indiana, Tennessee, Arkansas, Mississippi and Kentucky. He was formerly director of the Missouri Division of Resources and Development. Koehring has also appointed William B. Thompson as district representative in California, Arizona, Utah and Nevada. He will work out of San Francisco headquarters.

U. S. Steel Corp.: Kenneth Lieber has been appointed assistant vice-president in charge of sales of the National Tube Div. Since Jan. 1, he has been vice-president in charge of engineering for Consolidated Western Steel, which has recently been acquired by U. S. Steel Corp. His office will be at Pittsburgh, Pa.

In the Main Office

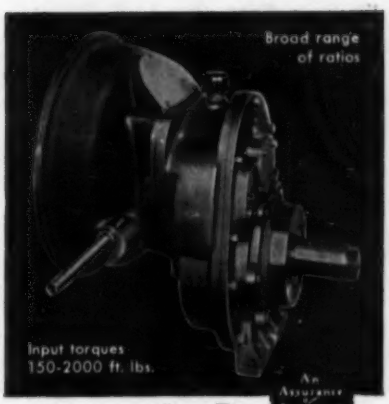
McDowell Co., Inc.: Thomas E. Ban has been appointed director of research. He will head research on lightweight aggregate development, cement making processes, and minerals processing.

Dravo Corp.: William E. Clark was elected executive vice-president. He was previously vice-president and general manager of the firm's Engineering Works Division.

Texas Portland Cement Co.: The board of directors has announced the election of Kent Diehl, Sr., of Houston, as president. His first job will be to supervise the building of a new $3 million, 1,500 per day plant. He is former president and general manager of Gulf Portland Cement Corp., Houston.

Koehring Co.: E. B. Hill, formerly vice-president and director of sales for Gar Wood Industries, Inc., has been added to the executive staff as assistant to the president. His duties will include advertising and export sales.

Lehigh Portland Cement Co.: C. Glenn Browning has been elected an executive vice-president of sales, and P. A. Groll has been named executive vice-president of manufacturing. Mr. Browning, a member of the board of directors, was vice-president and general sales manager of the company. Mr. Groll was formerly vice-president and operating manager.



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- **Reduction Units**
- **Mechanical Drives for Torque Converters**

Cotta Transmission Co., Rockford, Illinois

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"Engineered-to-order"

MAYO PNEUMATIC GROUTER and "PEA SHOOTER"

Simple to Operate

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The Mayo Grouter quickly and easily places low-pressure grout in tunnels, mines, shafts, foundations, and subgrades. It also may be used to inject sodium silicate emulsions for stabilizing caving or running ground.

This versatile piece of equipment can readily be converted to a "Pea Shooter" for shooting Pea or "Bird's Eye" gravel back of liner plates and backpacking outside lagging plates.

Write for Free Catalog 13 for full details and specifications.

MAYO

TUNNEL AND MINE EQUIPMENT

LANCASTER, PA.

Booth & Flinn Co.: L. S. Stanley has been elected a vice-president of the Pittsburgh construction company. For the last two years he has been contracting engineer for the firm. He will continue to supervise the engineering of industrial foundations and other heavy construction projects and will be responsible for obtaining new business.

Clark Equipment Co.: Samuel D. Richards has been appointed assistant to the treasurer. Mr. Richards was formerly assistant treasurer of the Studebaker Corp.

Borg-Warner Corp.: Howard J. Davis has been elected to the presidency of the Calumet Steel and Franklin Steel Divisions of Borg-Warner Corp. He succeeds W. B. Caldwell, who retired recently. Mr. Davis is a former president and director of the Wire Reinforcement Institute.

Hyster Co.: Anthony A. Pack, formerly with Vickers, Inc., hydraulic equipment manufacturer, has been named assistant to the president. Hyster manufactures a line of material-handling trucks and tractor-mounted job attachments.

Rust Engineering Co.: Frank L. Wilhelm has been elected assistant vice-president of the Pittsburgh contracting company. His most recent field assignment was as procurement manager for Rust's large project at Oak Ridge, Tenn.

Special Mention

Worthington Corp.: Has purchased a 15-acre factory site including a dozen existing buildings totaling more than 330,000 sq. ft of working floor space. Standard pumps and air-conditioning equipment will be manufactured at the new location.

Spencer-Hughes Corp.: Shareholders of the Champion Hardware Co., Geneva, Ohio, manufacturers of a line of builders' hardware, approved a merger with Spencer-Hughes Corp., Cleveland, Ohio. Champion will continue its present activity as a division of Spencer-Hughes.

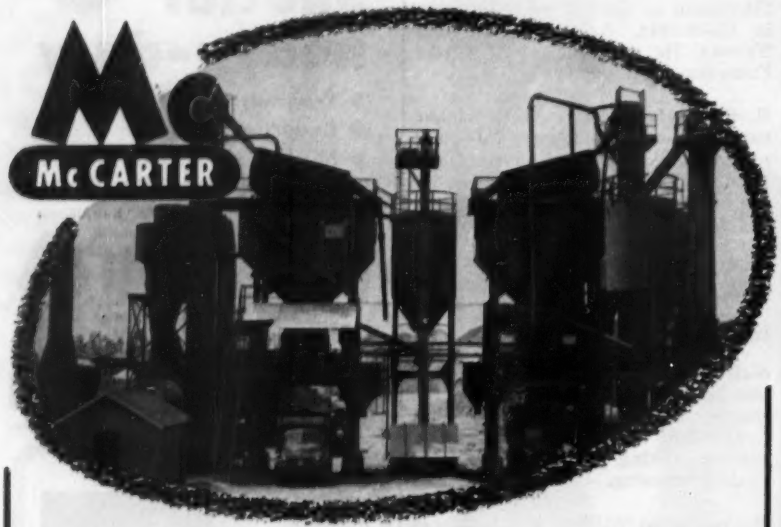
Georgia-Pacific Plywood Co.: Feather River Pine Mills, Inc., of Feather Falls, Calif., one of the largest producers of California pine, has been purchased by Georgia-Pacific. Included in the transaction were 35,000 acres of timber, largely pine. At the same time, Georgia-Pacific sold the National Wood Treating Corp, a subsidiary of Feather River Pine Mills, to Koppers Co., Pittsburgh, Pa.

American Crucible Products Co.: Kenco, Inc., Lorain, Ohio, manufacturer of submersible pumps for sump, industrial and contractor use, has been purchased by American Crucible Products Co. All operations will be carried on at 1305 Oberlin Ave., Lorain, under the name of Kenco Pump Div.

L. A. Young Spring and Wire Corp.: The purchase of Ottawa Steel, Inc., of Ottawa, Kan., manufacturer of roadbuilding and industrial construction machinery, has been announced by Young, world's largest manufacturer of wire products and a major automotive parts supplier. The purchase has been described as part of Young's diversification program. An expenditure of more than $1 million was involved.

Powell Steel Products Co.: All design production, shipping and office facilities will be under one roof in its new plant at Addison, Ill. Founded in 1943, the company manufactures metal lath accessories for the lathing and plastering industries. The new one-story plant is laid out to expedite the flow of raw materials through the manufacturing process into warehouse space easily accessible for shipment either by truck or railroad.

(Continued on page 162)



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2000 TO 6000 LB. CAPACITY

20 years experience in design and manufacture of this truly balanced equipment, assures McCarter customers of standardized parts and minimum costs.

McCarter standard plants — designed and manufactured in their own works are readily adaptable to your special requirements. Individual units also available.

DRYERS (hot or hot & cold material, center outlet type) • MIXERS • ASPHALT BUCKETS (Steam, hot oil or electric heated) • AGGREGATE HOPPERS • BINS • APRON TYPE FEEDERS • CYCLONE COLLECTORS • ELEVATORS • STEEL STRUCTURES

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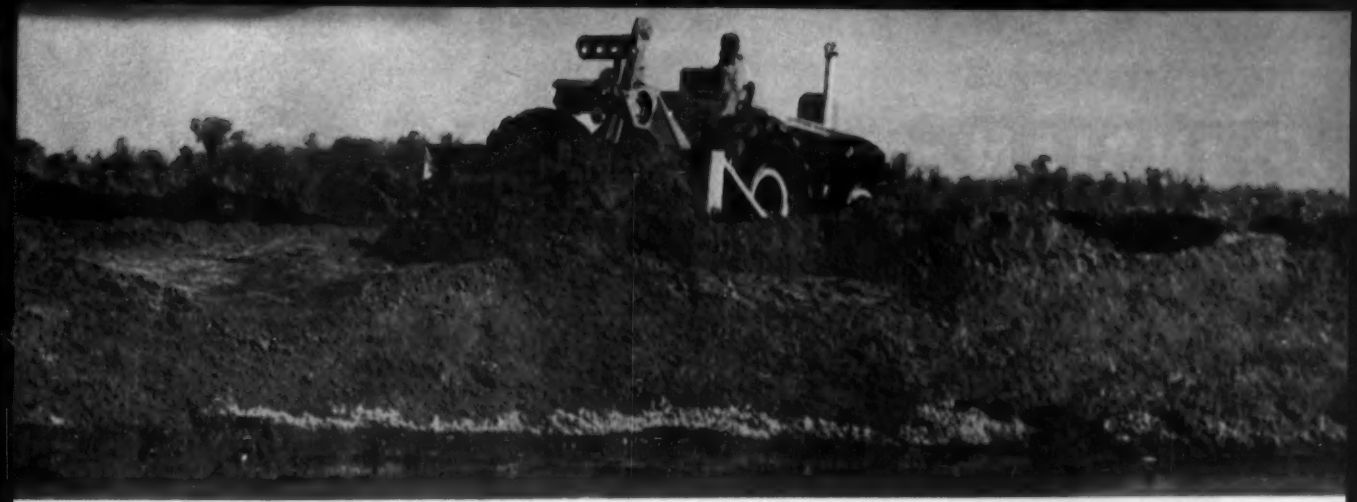

Blythe Brothers, Morrison-Knudsen

cut maintenance with tractors-on-rubber

An ideal answer to the problem of excessive crawler track maintenance is reported by officials of Blythe Bros. Company, Charlotte, North Carolina, and Morrison-Knudsen Company, Inc., Boise, Idaho.

These two nationally-known firms, on their million-yard joint venture at Alvin Callender Air Base near New Orleans, have replaced 148 hp crawler-type tractors with two 208 hp rubber-tired Tournatractors.

This job, with its continuous work in Mississippi River-bottom sand, proved a nightmare for the crawlers. Most of the time, it was necessary to replace pins and bushings and build up rails and rollers about every 900 operating hours. Each time the repair job was done, it cost about $2,000 per tractor.

Tires cut track rebuilding costs

Tournatractor tires have practically eliminated these troubles. These big single tires roll easily over the abrasive sand. In months of double-shifting, they have required no maintenance other than inflation.

Sand dumped by Tournapulls is dozed out over swampy ground. This is method contractors are using, together with dragline-stripping and side-casting of 7′ of top muck, to fill an age-old cypress swamp. Sand — over 1,000,000 yards of it — is dredged from the Mississippi River and hauled in. It is so abrasive that crawler tracks require rebuilding every 900 hours.

High output is reported for Tournatractors, too. Pushing sand dumped by Tournapulls to fill over a swamp, they average a 300′ dozing cycle every 32 seconds. Push forward is made in third gear (8 mph) . . . return in second (also 8 mph). The 150′ dozing distance takes an average of 19 seconds . . . the 150′ return, 13 seconds. Loads vary from 2 to 2½ cubic yards . . . output per 55-minute hour, from 200 to 250 cubic yards.

Travel 19 mph job to job

In spare time, Tournatractors make good use of their 19 mph mobility to handle odd jobs around the 4.7 square mile construction area. Units "run" everywhere . . . cross pavements, tracks without planking . . . travel up to 1,670 ft. per minute to do such odd-job assignments as cleaning the haul route. At times, units have also been used to pull 50-ton rubber-tired compactors.

Let us show you what speed, plus elimination of track problems, can do for you. In sand, reduced maintenance alone can quickly pay for your Tournatractor. In less abrasive materials, you'll find one or two of these versatile tractors ideal for fast work all over the job site. Write today for new bulletin and specifications.

Tournapull, Tournatractor—
Trademark Reg. U.S. Pat. Off. T-813-A-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

INDIAN

DRINKING WATER & SUPPLY TANK NO. 75G

Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular.

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Low-priced power Sprayer

12 gallon capacity

For spraying silicon water repellents for masonry and cement work and many other spraying purposes. Briggs and Stratton Motor. Very high quality.

D. B. SMITH & COMPANY

"Choice for Quality the World Over"

450 Main St. Utica 2, New York

WATER MAIN PRESSURE TEST PUMP

PORTO PUMP A ROTARY, RUBBER GEAR PUMP MECHANIZES AND EXPEDITES THE PRESSURE TESTING OF WATER MAINS AND FIRE SPRINKLER INSTALLATIONS.

Quickly develops required testing pressure up to 200 PSI, powered by dependable 4 cycle gasoline engine, weighs 95 lbs., only one man required for pump operation, saves time and labor, increases profits,—also excellent for jetting operations, core and exploratory drilling operations, cleaning transit mix cement trucks and dirty equipment, wetting down poured concrete structures, such as bridge supports, and various other applications requiring a portable pressure pump.

Dealers Inquiries Invited

PORTO PUMP, INCORPORATED

727 IRON STREET, DETROIT 7, MICH.

SALES AND SERVICE . . .

Continued from page 160

Allis-Chalmers Mfg. Co.: Announces the establishment of six major operating divisions within the company which will serve to strengthen its position in the markets and provide faster direct line service to its customers. Of the six divisions each headed by a general manager, three will be in the industries group, formerly known as the general machinery division. J. L. Singleton, vice-president and company director will head the industries group and W. G. Scholl, vice-president and company director will head the tractor group.

Certain-teed Products Corp.: Gold Seal Asphalt Roofing Co. has sold 98% of its stock to Certain-teed. No changes are contemplated in Gold Seal's sales policies or personnel. They manufacture asphalt roofing and insulating siding products at their plant in Chicago Heights, Ill.

Caterpillar Tractor Co.: The newest of Caterpillar's U. S. plants is nearing completion and is expected to be in full operation later this year. It is situated on a 425-acre tract of land a mile northeast of Decatur, Ill.

Hercules Galion Products, Inc.: Stockholders of Hercules Steel Products Corp. and Central Ohio Steel Products Co. voted recently to approve the merger of the two firms. Hercules Galion will manufacture dump bodies and hoists, concrete mixers and cement spreaders, in addition to other diversified products.

Association Activities

National Association of Home Builders: Gordon G. Hazell, architectural engineer with the Veterans Administration, has been named an assistant director of the Construction Dept. and Research Institute of the National Association of Home Builders. At the same time, C. O. Christenson, NAHB Director of Technical Services, resigned to become Director of Engineering for John E. Bauer, an Indianapolis home builder.

Building Research Institute: Edmund Claxton, director of research for the Armstrong Cork Co., is the new president of the BRI. The new vice-president is William Muirhead, president of Muirhead Construction Co. of Durham, N. C. William H. Scheick continues as Executive Director.

Douglas Fir Plywood Association: Duane G. McQuilkin has been appointed a member of the merchandising department. His duties will be in the area of dealer merchandising including distribution of point-of-sale display materials, dealer education materials, dealer mat services and other promotion aids.

Stay one LEAP ahead

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- See where the most new work is coming into the market
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- Watch how much wage rates and labor benefits are rising in new contracts
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For your sample copies of CONSTRUCTION DAILY and information on how this construction market letter can help your business, write to

Circulation Manager,
CONSTRUCTION DAILY,
330 W 42 St, New York 36, N. Y.

Dirtmoving for Disneyland

After 20 years of dreaming and planning, Walt Disney's fabulous Disneyland is at long last a reality. Located just off the Santa Ana Freeway about 30 minutes from Los Angeles, this giant playground is expected to attract 5 million visitors yearly. Main attraction will be a castle filled with life-size Disney cartoon characters (Fantasyland). There'll also be a log fort and authentic buildings of the Old West (Frontierland). There'll be boat voyages past lifelike displays of romantic parts of the world (Adventureland) and "rocket trips" to a city of the future (Tomorrowland).

To the realization of this whole magical $10,000,000 Disney kingdom, Contractor S. A. Cummings, Compton, California, played an important part. Cummings' 5 C Tournapulls handled nearly all dirt work on the 160-acre tract . . . moving 280,000 cubic yards of sand and sandy loam in 6 months. Almost all of the yardage moved was precision work. The "C's" dug boat channels, hauled material for railroad embankments, built artificial hills and even rocket platforms. They graded a parking area for 10,000 cars, leveled building sites, dug several lakes, a castle moat, and a storm drain.

5 Tournapulls move 300 yds. hourly

In typical operation — excavating a 5-acre lake and spreading the material to build up 20′ berms for a ⅝-scale model railroad — each of the 5 Tournapulls was push-loaded with 12 pay yards of sand per load. Typical 6,600′ cycles, with most of haul up 5 to 10% grades, took 10 minutes. Output per machine per 50-minute hour averaged 60 pay yards . . . output for the fleet of 5 "C's" averaged 300 pay yards per hour.

Ralph Gastelum, Supt. for Cummings, reports, "I believe this job was ideal for Tournapulls because of the sand we had to work with, and the small places we had to maneuver in. Fills were high and narrow, and cuts, particularly the channel cuts, small and winding, which made it very difficult to load . . . yet Tournapulls did an excellent job."

Let us show you how Tournapulls can help speed your jobs, too. Call or write for details on performance . . . price . . . and delivery!

Tournapull—Trademark Reg. U.S. Pat. Off. P-838-8-b

NOW . . . a size Tournapull TO FIT YOUR NEEDS

Model B . . . 23 yds. heaped Model C . . . 16 yds. heaped Model D . . . 7 yds. heaped

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

CONSTRUCTION EQUIPMENT NEWS

Needs Only Limited Headroom

Track-mounted Eimco 630 Loader permits loading in areas with headroom limited to 6 ft 8 in. At that height bucket capacity is 6 cu ft, discharge height, 44 in. The bucket drive gives 6,000 lb digging force at the bucket lip. It is powered with an air or electric motor with controls at the side, back or on top.—**Eimco Corp., 654 S. 4th West St., Salt Lake City, Utah.**

Cambered Boom for Smaller Crawlers

Greater digging radius and depth are claimed for Bucyrus-Erie's smaller dragshovels when used with a new cambered boom. The boom is designed for sewer trenches, pipelines and other light digging jobs. It allows the shovel to be positioned farther from the embankment, and permits digging over corners of the crawler.—**Bucyrus-Erie Co., S. Milwaukee, Wis.**

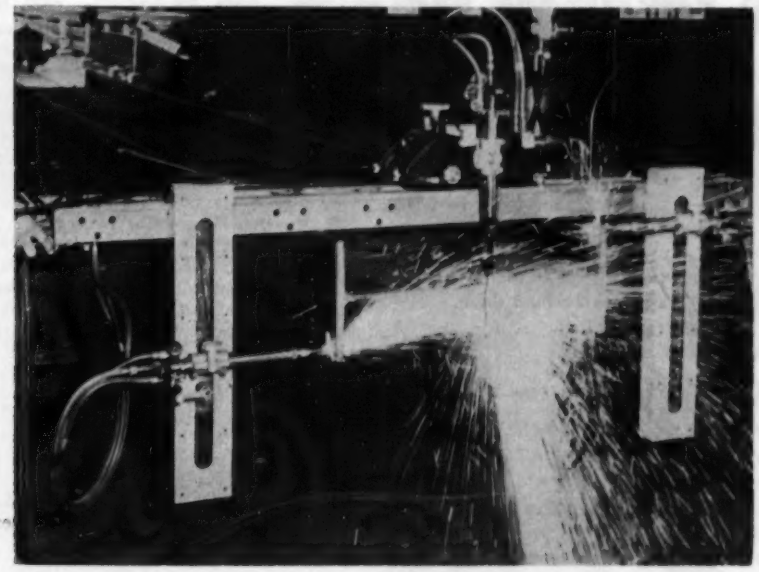
Scraper With Torqmatic Drive

Euclid is now in production with the S-18, a new single-engine scraper with a struck capacity of 18 yd. Like the TS-18, a dual-engine scraper, the S-18 is equipped with Allison Torqmatic Drive. Full 90-deg steering permits it to make 180-deg turn in 35 ft. As on other Euclid scrapers, bowl lift, apron and ejector are independently controlled by hydraulic lever action. The S-18 is powered by a 300-hp engine. It uses 27.00x33 tires.—**Euclid Div., GMC, Cleveland, Ohio.**

Small Crawler Side Boom

A side boom for the Oliver OC-3 can handle a 1,600-lb load. Because 10-ft boom connnects low on the crawler, its center of gravity is not greatly disturbed. Unit weighs only 5,205 lb.—**Oliver Corp., 400 W. Madison St., Chicago, Ill.**

On-the-Job Previews of Machinery, Tools and Equipment



Portable Flame Saw Cuts 36-In. Beams

A portable flame saw requires only 110 v to cut a 24-in. structural beam in 1 min. A tubular steel carriage on wheels makes the saw highly portable for on-the-job applications because the beam to be cut serves as the work surface. All the operator has to do is to just slide the saw up to the beam, set the torches and start cutting. Manufacturers claim it is quieter and quicker than mechanical saws, will cut straight, miter, or even the edges of steel beams from 3 to 36 in. without difficulty.—**K-G Equipment Co., Allentown, Pa.**

Powerful Truck Crane

Jobs considered difficult for a light truck crane can be handled by the H-5 Hydrocrane. Mounted on conventional truck, it serves as a ½-yd excavator or as 9-ton erection crane. Boom will extend to a height of 50 ft.—**Bucyrus-Erie Co., S. Milwaukee, Wis.**

Tamps Narrow Ditches

Handlebars that adjust horizontally as well as vertically let an operator work this tamper in trenches as narrow as 10 in., as deep as 5 ft. It's called the GT-5-D. —**Gunderson-Taylor, 1237 Shoshone St., Denver, Colo.**

Turbocharged Rubber-Tired Dozer

The Michigan 180, a new rubber-tired dozer powered by a turbocharged engine, has a hp rating of 165, bowl capacity of 2¾ yd. Like the Michigan tractor-shovel line, also manufactured by Clark Equipment Co., the Turbo-Dozer features a power shift transmission, heavy-duty torque converter with 3 to 1 multiplication, and planetary wheel-drive axles. An outstanding feature of the new machine is its power-tilted bowl or blade that is raised and lowered with two cylin-

Automatic Free-wheeling 2-wheel drive for 4 W. Ds.

WARN *Automatic* HUBS

automatically engage or disengage the front wheels from the power train as you shift into 4-wheel drive, or back to 2-wheel drive.

Go farther, faster, easier—roads or no roads!

No matter where you drive, whenever you use 2-wheel drive it's fast, economical *free-wheeling* 2-wheel drive with Warn *Automatics*. For 4-wheel drive, shift! You have it, *plus something new*—torque-free high speed driving in 4 w. d.! Warn Hubs stop drag, save gas, gears, tires in 2 w. d.—make 4 w. ds. peppy as pick-ups! Install them now—use your 4 w. d. for any purpose! Automatic and Locking models for Willys at Willys Dealers only. For other 4 W. Ds. at dealers or write:

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WARN SELECTIVE DRIVE HUBS

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KOHLER ENGINES

4-CYCLE • AIR-COOLED

A Quality Engine for Quality Equipment

Short Stroke

- Less Friction and Wear
- More Power
- Longer Life

Easy Starting

K90	2.5 to 3.6 H.P.
K160	3.6 to 6.6 H.P.
K330	7 to 11.8 H.P.
K660	12 to 26 H.P.

Kohler Co., Kohler, Wisconsin
Established 1873

KOHLER OF KOHLER

PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION CONTROLS

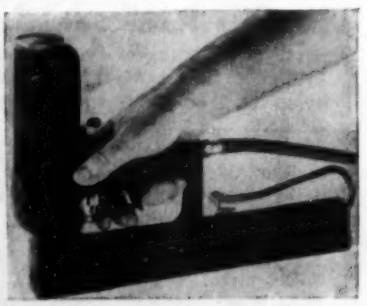
ders and tipped back and forth with a 6-in. hydraulic cylinder.

The digging angle of the blade can be changed from cutting to float, or any other position, while the machine is in motion.

The power transmission has a locking differential in the front axle that automatically applies power to the wheel with the firmest footing when one wheel begins to slip. The steering drive oscillates to maintain ground contact on all wheels when the terrain is uneven.

Other features include a 24-v electrical system, 18.00x25, 12-ply tires, vacuum boosted four-wheel brakes and a 50-gal fuel tank to permit an average day's work without refueling.

The Turbo-Dozer is 8 ft 4¾ in. high over the air cleaner, 9 ft 9 in. wide at the bowl and 17 ft, 1 in. long with the bowl vertical to the ground. Its wheelbase is 7 ft 4 in., and ground clearance is 14¼ in. Weight is 27,000 lb.—**Construction Machinery Div., Clark Equipment Co., Benton Harbor, Mich.**

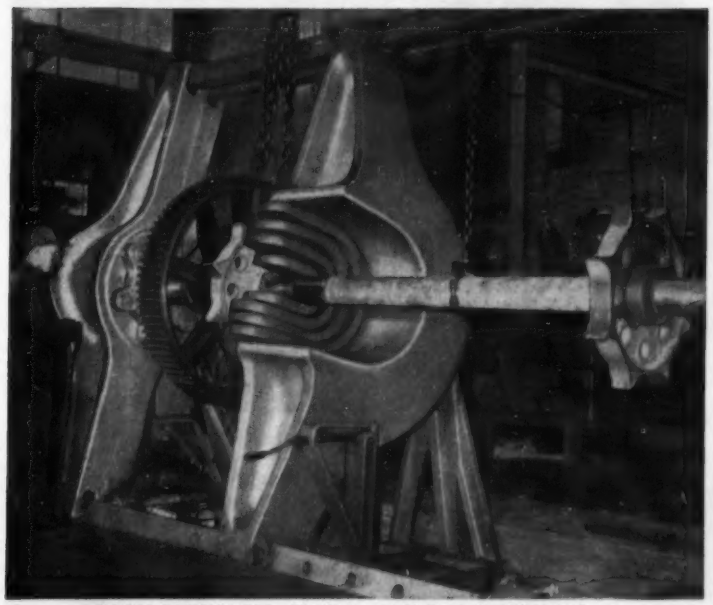


DRIVES FASTENERS—New pneumatic nailer features light weight, low center of balance and lack of recoil, according to the manufacturer. With 100 lb of pressure fasteners up to 1 3/16 in. can be driven and countersunk in any wood. Magazine holds 200 fasteners, said to be the largest load for any portable fastener, and loading takes only 5 sec.—**Spotnails, Inc., 1527 Lyons St., Evanston 25, Ill.**

SURVEY TRANSIT—This unit weighs only 9 lb and is extremely compact. It is designed especially for field work where minimum weight is desirable. It has a 5-in. dia horizontal circle and a 4½-in. dia vertical circle. Both read to 30 min with vernier readings to 1 min. The telescope is 9 in. with a 23 power magnification. Stadia lines are fixed at 1:100 ratio. This imported instrument is made to American standards under American supervision and is thoroughly rechecked on arrival in U. S. Sold under full money-back guarantee. Price $350.—**Umeco Optical Division, 465 California St., San Francisco 4, Calif.**

A MOUNTAIN of POWER

—or a touch of pressure



POWER FOR BIG JOBS—This Rodgers 600-Ton Inclined Forcing Press is forcing a large gear and sprocket from a mine machine shaft.

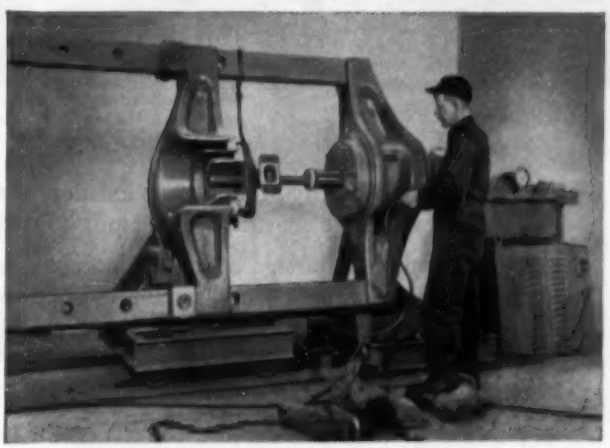
The heavy machines and equipment used in the great iron mining industry present a variety of problems when repair or maintenance is necessary. For this work the accurately controlled action of Rodgers Hydraulic Forcing Presses is a real time and work saver.

A Rodgers Forcing Press puts a mountain of power at your fingertips to force wheels, sprockets or gears from their shafts and for straightening, assembling, swedging or upsetting jobs. Operators also use the versatility, speed, power and positive control of a Rodgers Forcing Press to efficiently perform small pressing and forcing jobs with just a touch of pressure—tasks once done only on vertical shop presses!

you get both with RODGERS FORCING PRESSES

Rodgers vertical, horizontal and inclined forcing presses offer capacities from 100 to 600 tons . . . up to 9 feet between tension bars . . . up to 16 feet between ram and abutment . . . single or double acting cylinders with 13 or 26-inch ram travel (72-inch travel available) . . . electrically powered hydraulic pumps with selective, positive pressure adjustment and remote control . . . removable press cylinders that can be used in special jacking or pulling jobs . . . and many more features that assure you of dependable, long life operation—all fully described in this Rodgers Catalog Number 315A.

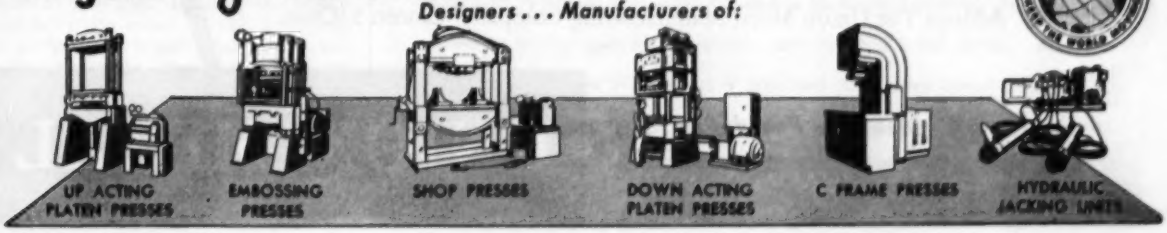
Write for it today!



LIGHT TOUCH FOR SMALL JOBS—This Rodgers 300-Ton Inclined Forcing Press is used on small as well as large equipment repairs. Here, a pin is being pressed out of a tractor idler support bracket.

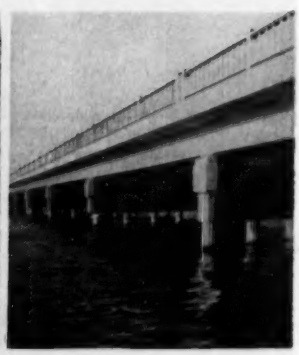
Rodgers Hydraulic Inc. 7403 Walker Street, Minneapolis 16, Minn.

Designers . . . Manufacturers of:



WITH Monotube Foundation Piles

...BIG SAVINGS IN BRIDGE CONSTRUCTION



WHEN you specify Monotube foundation piles for highway or railroad bridge construction . . . jobs go faster, costs stay low.

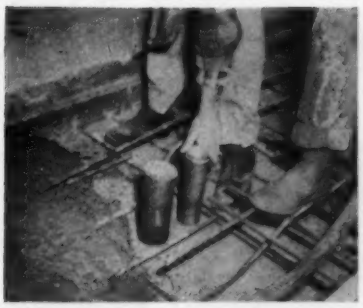
The tapered, fluted design of steel Monotube piles means faster driving. Monotubes are easier to handle and transport because of rigid, light weight construction. There's no need for special rigs or heavy driving equipment.

With a simple, single weld, Monotubes are readily extended to any required length, right on-the-job. Cut-offs can be used as extensions to eliminate waste. Monotubes are cold-rolled for added strength and long life.

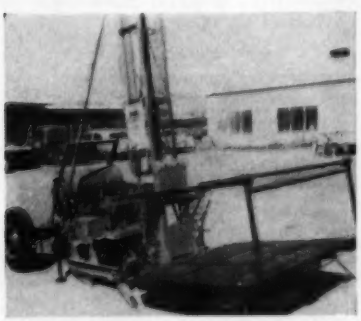
Before starting that next foundation job, whatever or wherever it may be, remember, Monotube piles offer you specific advantages that pay off in sound construction and unusual economy. Write today for your copy of Catalog No. 81. Address The Union Metal Manufacturing Company, Canton 5, Ohio.

Monotube Foundation Piles

UNION METAL



PIPE SLEEVE—A wax-impregnated fibre tube called a Sonopipe Sleeve, is lightweight, yet strong enough to withstand the pressure of poured concrete floors, roof decks, walls and other concrete members in which cores are required for plumbing or conduit lines. The sleeves, which can be cut quickly with a hand saw to desired lengths, come in diameters ranging from 2 to 8½ in. with a thickness of .125 in. Two metal ends, with anchors to keep the tube straight, are used with the tubes. The metal end is nailed to the form, the tube placed over it and the top metal end applied. After the concrete is poured the metal ends are knocked out and the pipe, which is well insulated, can be left in place or removed. The fibre sleeves can also be used to form drains in bridge decks and weep holes in concrete walls.—**Sonoco Products Co., Hartsville, S. C.**



PORTABLE ELEVATOR—A hoist that can be towed to a job site and erected in 2½ min is operated by a two-cylinder gas engine coupled to a hydraulic unit. It can drive the platform and 1,000-lb load up or down at 100 fpm. The hoist is free-standing at 24 ft, but extra sections can be added to make the tower over 100 ft, according to the manufacturer. Called the Tusky, the hoist's features include a safety catch in the event of cable failure, a governing device that automatically prevents overloads, and an alternate manual control system in the event of power failure. Ready for towing, the hoist weighs 2,650 lb, is 26 ft long, 96 in. high and 70 in. wide.—**Tubular Structures Corp. of America, 2960 Marsh St., Los Angeles 39, Calif.**

Crail Bros. Co., Long Beach, California, using a Moto-Crane with **two Waukesha Engines**—(powering the boom) a **140-GK Gasoline,** six-cyl., 4½-in. x 5½-in., 525 cu. in., 160 max. hp. at 2250 rpm; and (powering the chassis) a **145-GKB Gasoline,** six-cyl., 5¼-in. x 6-in., 779 cu. in., 240 max. hp. at 2400 rpm. Being spotted is a 22-ton Gardner-Denver mud pump with **two WAKU Waukesha** LP or natural gas units, six-cyl., 6¼-in. x 6½-in., 1197 cu. in.; each 213 continuous hp. at 1300 rpm.

EVERYWHERE in the industrial picture

WAUKESHA ENGINES

Multi-Unit Waukesha Horsepower—this MC-524 Lorain has it! So does this Gardner-Denver mud pump that's being spotted in the Long Beach outer harbor area. Two Waukeshas give the Moto-Crane safe, sure, steady power, with a ready reserve for heavy handling. Fast, flexible power, too, for speedy movability and reliable road travel. And the mud pump with its Waukeshas is powered to remove about 700 gal. of heavy oil mud per minute in oil well deep drilling jobs. Send for Bulletins.

286

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

WHITE VIBRATORS COST LESS TO BUY, LESS TO MAINTAIN, GIVE BETTER PERFORMANCE

EXCLUSIVE FEATURES INCLUDE:

. . . completely interchangeable drives and heads, no special couplings required, less spares needed for maintenance.

. . . heavier eccentric rotors in vibrator heads for better performance in concrete.

. . . power units, either gasoline engine or electric motor interchangeable.

. . . vibrator heads, from 1⅝" to 3", and grinding heads interchangeable.

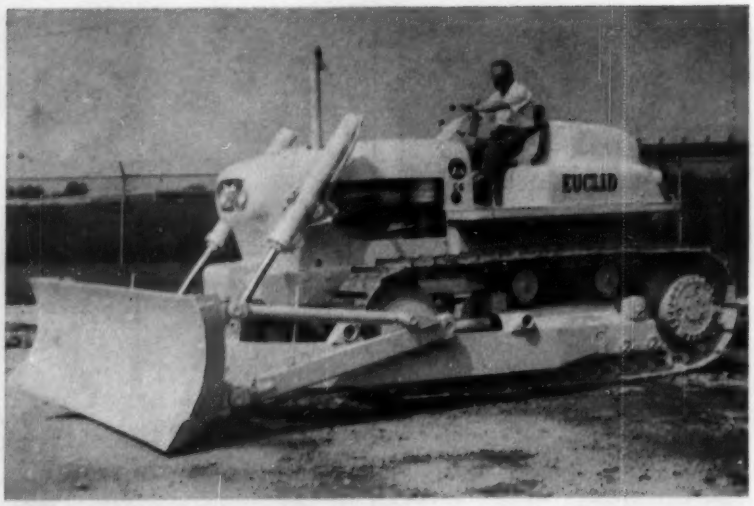
. . . replacement drive shafts cost less.

Model M-12, with 4.6 HP Wisconsin engine, wheelbarrow mounted.

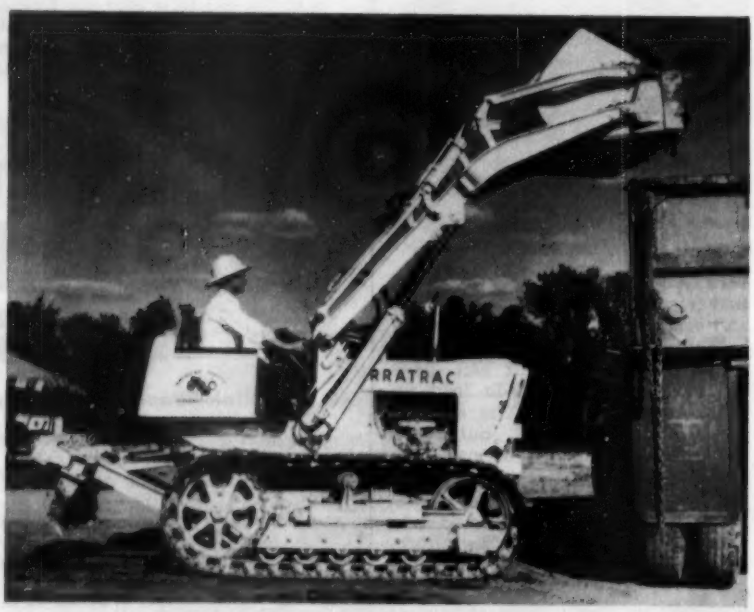
Model ME-13, with 2.5 HP, 110-volt electric motor.

Model M-9, with 2 HP Lauson engine, automatic clutch.

White
MANUFACTURING COMPANY
ELKHART 6, INDIANA

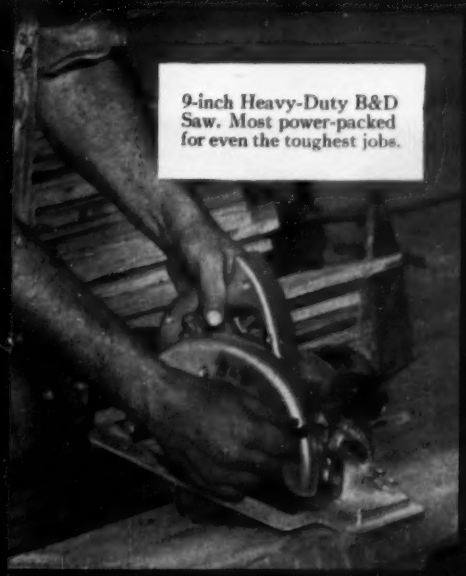


THE TC-12's HALF-BROTHER—The C-6 crawler, second in a line planned by the Euclid Div. of General Motors, is being demonstrated for the first time at the Powerama show celebrating the delivery of GM's 100,000,000th diesel hp. The C-6 is, in effect, a half-section of the twin-engined 388-hp TC-12. It is powered by a 194-hp Detroit Diesel 6-71 engine with Allison torque converter and torqmatic transmission that allows it to shift under full power without loss of motion. The C-6 features the same styling as the big TC-12 and has the same controls, automatic track tensioning, planetary final drive gearing and rear-mounted swing-down radiator. The C-6 has three speed ranges in both directions with a top forward speed of 8.3 mph. Weight of tractor, less attachments, is 34,000 lb. Also being shown for the first time at the Chicago GM show is the S-12 scraper, an overhung-engine type similar to the S-7, S-18 and the twin-engine TS-18. The S-12, with 12-yd struck capacity, is powered by a 218-hp engine with a standard transmission giving five forward and one reverse speeds. Other features are hydraulic steering and scraper controls, reversible offset cutting edges on the scraper bowl and planetary final drive gearing in the tractor drive axle. Tires are 26.5x25, 26 ply.—**Euclid Div., General Motors Corp., Cleveland 17, O.**

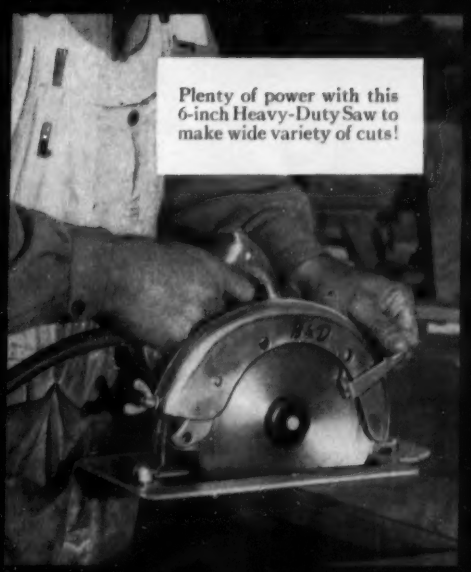


TERRATRAC'S NEW LINE — An instant-shift transmission and torque converter drive—new to the smaller tractor field—were introduced this month at the first of 100 "Tractorama" shows planned by TerraTrac dealers across the country. Both the Borg-Warner converter and Terramatic transmission

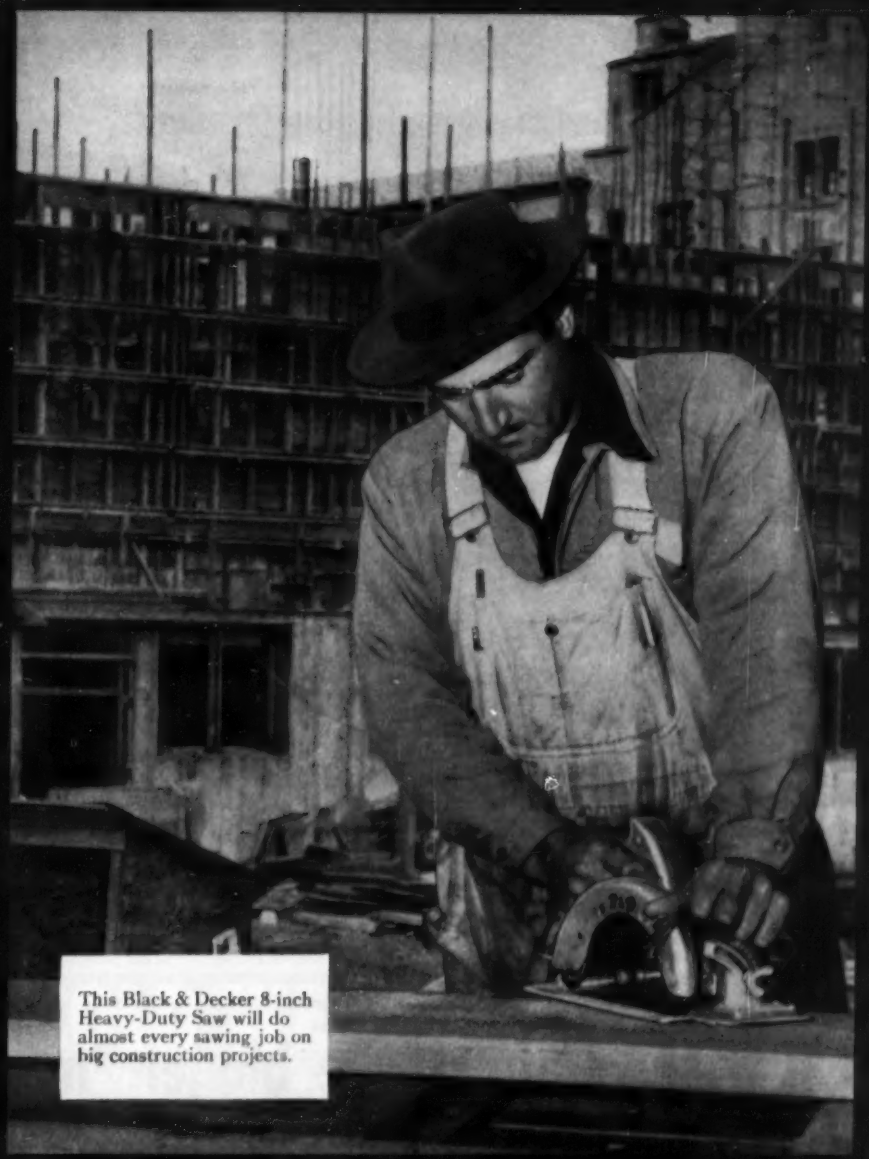
(Continued on page 173)



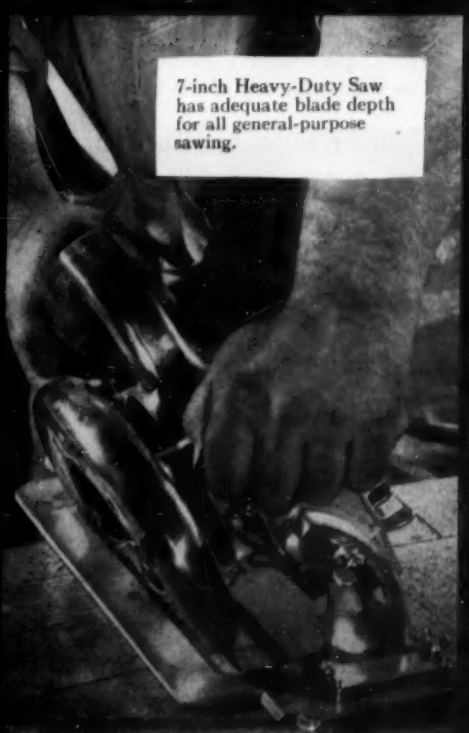
9-inch Heavy-Duty B&D Saw. Most power-packed for even the toughest jobs.



Plenty of power with this 6-inch Heavy-Duty Saw to make wide variety of cuts!



This Black & Decker 8-inch Heavy-Duty Saw will do almost every sawing job on big construction projects.



7-inch Heavy-Duty Saw has adequate blade depth for all general-purpose sawing.

Make light work of heavy construction sawing

What do you want in a portable electric saw? Power? Durability? Versatility? Fast adjustment? Safety? You get 'em all in Black & Decker Saws! B&D-built motors pack these saws with power. Saws are sturdily constructed for continuous, trouble-free, heavy-duty operation. They make all types of cuts in almost all building materials. Adjust quickly and easily. And they have all of the latest safety features. Try 'em yourself. See your Black & Decker distributor for demonstration. Also write for full information to: THE BLACK & DECKER MFG. CO., Dept. 2609, Towson 4, Maryland.

For nearest distributor, see "Tools-Electric."

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker®

PORTABLE ELECTRIC TOOLS

(Advertisement)

GMC'S NEW BLUE CHIP MODEL MW620-42 (at right) gets the power to hustle extra-hefty loads over tough terrain from a rugged 190-h.p. truck engine. Twin Hydra-Matic Drive eliminates shifting effort—protects engine, axle and drive-line. The MW620 has a new 34,000 lb. capacity tandem axle—is rated for 42,000 GVW-65,000 GCW work. The GMC M500 awaiting its turn at left is a two-axle model powered by a 155-h.p. engine that's teamed with 8-speed Hydra-Matic. It's rated at 24,000 GVW.

They've got the bigger "muscles" a construction hauler needs

THEY'RE even brawnier than they look—the 19 rugged new tandem-axle jobs spanning the 28,000 GVW-90,000 GCW range in GMC's great new Blue Chip line.

Their frames, for example, are of a unique new design that builds in super-stamina. If your operation is unusually severe, full-length reinforcements* can be installed right at the factory. There are new extra-capacity axles—front and rear.

And the big choice of power plants—gasoline or Diesel—155 to 230 h.p.—can swing a lot more work with their high torque output—do it faster and with less strain. When time and tonnage are closing in on you their reserve power makes the big difference.

Bigger Clutches, Too

New 2-plate 14-inch clutches give you up to 76% greater working surface—prolonging clutch-life and making shifting easier. Or you can eliminate all clutch-and-shift work—and all clutch repairs as well—with any of the 9 new Hydra-Matic models.

In all 19, you can have Safety Power Steering* to help drivers with the tough going. And every one of them has the kind of rims-to-roof ruggedness that makes down-times fewer and farther between—truck-life longer and more profitable.

In this big range of models, there's sure to be one made to order for your job. Check on it at your GMC dealer's today!

**Optional at extra cost*

See GM Diesels at work at the

General Motors Powerama

Lake Shore Drive, next to Soldier Field, Chicago

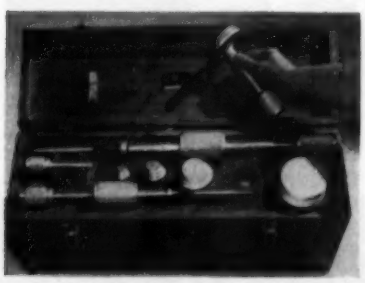
August 31 through September 25

GMC TRUCK & COACH—*A General Motors Division*

EQUIPMENT NEWS . . .

Continued from page 170

are standard equipment on the model 600 TerraTrac (p 170) which has a drawbar pull of 15,800 lb, weighs only 9,500 lb. The Terramatic transmission is a constant-mesh gear train combined with hydraulic clutches that allows automatic shifting in any speed or direction without loss of momentum. It provides 4 speeds forward up to 5.63 mph and 4 speeds in reverse up to 6.2 mph—extremely fast for crawlers in the Terra-Trac class. In addition to the converter, added weight in the tracks and side frame increase the 600's drawbar pull. The 600, powered by a Continental engine, is 9 ft 2 in. long, 5 ft 2 in. wide and has a ground clearance of 16 in. TerraTrac model 500, with a drawbar pull of 11,200 lb., is equipped with a torque converter and standard transmission. Selling without attachments for less than $4,200 fob factory, it has three forward speeds up to 4.88 mph and a reverse gear giving 2.17 mph. It is 8 ft 6 in. long, 5 ft 1 in. wide, has a ground clearance of 16 in. Its shipping weight is 8600 lb. The new line of TerraTrac loaders, with capacities of from ½ to 1 yd, have been redesigned with bigger hydraulic lift and tilt cylinders to increase break-out power. Roll-back action and lifting speed have also been increased. The larger models feature a dumping height of more than 9 ft. As a sales incentive, TerraTrac offers a 9-ton tandem axle low-bed transportation trailer at half the usual price with the purchase of a new TerraTrac. **—American Tractor Corp., Churubusco, Ind.**



OIL SEAL PULLER—A set to remove oil seals without damaging the seat or surrounding material should be of interest to maintenance men. The Oil Seal Puller set removes all sizes of seals from ⅜ to 4½ in. It consists of two hammers and six expanding heads, which may be purchased separately according to sizes

(Continued on page 174)

'round the clock!

. . . without watching!

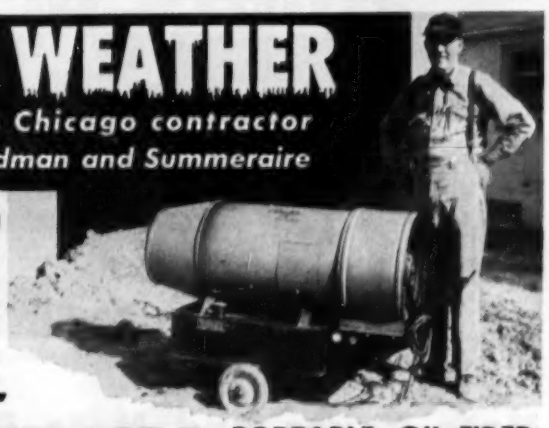
24 hours a day, seven days a week, this electrically controlled Marlow Self-Priming Centrifugal Pump automatically pumps seepage water up and over a 75-foot wall at this busy quarry. When you need dependable pumping for rugged service, see your Marlow dealer for the complete Marlow line of AGC rated pumps or write for Bulletin C-04.

MARLOW PUMPS
Ridgewood, New Jersey
Divison of Bell & Gossett Company

B-127

COLD WEATHER
Can't stop Chicago contractor
Helmar Hedman and Summeraire

300,000
BTU's PER HR.
. . . yet priced 20-30% lower than smaller heaters



Clayton
SUMMERAIRE PORTABLE, OIL FIRED SPACE HEATER
for
Fast, Low Cost
HEATING
DRYING
THAWING

Helmar Hedman, like all contractors, makes money when jobs are finished on time . . . *weather or not.* Summeraire chases winter cold . . . dries out new construction; prevents freezing of concrete while curing; keeps workmen warm. Durable, portable, self contained; electric or gasoline engine drive, Summeraire delivers 2400 cu. ft. high velocity heated air per minute at amazing economy. 300,000 BTU capacity at a price 20-30% lower than that of smaller heaters.

CLAYTON MANUFACTURING CO., Box 550 El Monte, California
Without obligation, send complete details, prices and name of nearest Summeraire dealer.

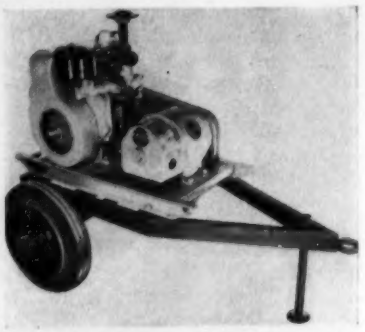
NAME_____

ADDRESS_____

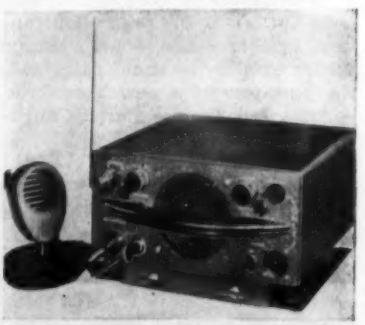
CITY_____ STATE_____

needed. Oil seals are removed by attaching the proper size expanding head to the hammer and inserting it into the oil seal opening. The hammer is then screwed into the expanding head until the head is snug. A few taps of the hammer remove the seal.—**Patton Manufacturing Co., 1802 W. Pleasant St., Springfield, Ohio.**

CHAIN - BREAKER — This device takes the "Ouch!" out of separating links, eliminates painful finger bruises, and ends damage to links, is faster, simpler to operate and harmless to the fingers. With this breaker, perfect alignment is possible with the use of the eye only. It works this way: the operator places his chain in the breaker block, quickly lines up the rivet with the punch, pushes down the handle and punches out the rivet. Links can be reused merely by inserting them in the breaker block and punching out the old rivets. The price of Mall's chain breaker, including block and punch for 9/16-in. pitch chain, is $14.95. A punch, that can be used with all blocks, sells separately for $2.10. Blocks for ½-, ⅝-, and ¾-in. pitch chain are priced at $2.25 each. —**Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill.**



ECONOMICAL GENERATOR—A gasoline engine generator, said to be especially suited for economical use under full load for long periods of time, is powered with a 12-hp, 2-cylinder, air-cooled engine, which the manufacturer says will provide full output at 22,000 rpm. Called the HG-4B-TF, the 120-volt, 3-KW, V-belt driven generator will simultaneously operate a Maginniss Hi-electric concrete vibrator, 1,000 watts of lighting and a universal tool. The compact model comes with a skid base or two-wheel rubber-tired trailer.—**Maginniss Power Tool Co., 154 Distl Ave., Mansfield, O.**



COMPACT RADIO—10x9x5-in. two-way radio can be transferred from vehicle to vehicle in two minutes, requires no adjustment to the vehicle's electrical system, according to the manufacturer. Called the J Pak-Fone, it will operate from 6, 12, 24 volt DC or 115 VAC, or it can be operated by a 12-volt aircraft-type storage battery. Heavy reinforced steel case is waterproofed for outdoor use. Frequency modulation and relay type squelch circuit provide clear telephone communication.—**Industrial Radio Corp., 428 N. Parkside Ave., Chicago 44, Ill.**

In Rome, Italy

Moto-Paver resurfacing airport at Rome, Italy

or Rome, N.Y.

Moto-Patcher repairing street, Rome, N. Y.

Moto-Paver and Moto-Patcher Speed the Job—Cut the Cost

In Rome, Italy, the main runway of the Ciampino Airport was completely resurfaced in two weeks recently with a single Moto-Paver. This job was accomplished while the runway was in daily use, and could be worked on only three hours each day.

In Rome, New York, both the Moto-Paver and the Moto-Patcher have delivered cost-cutting performances in resurfacing and patching streets respectively. These are but two examples of how the Moto-Paver and Moto-Patcher are speeding the job and cutting the cost on road, street and airport jobs in all parts of the U. S., Canada, South America, Europe and Africa.

New Bulletin MP-55 will be sent on request.

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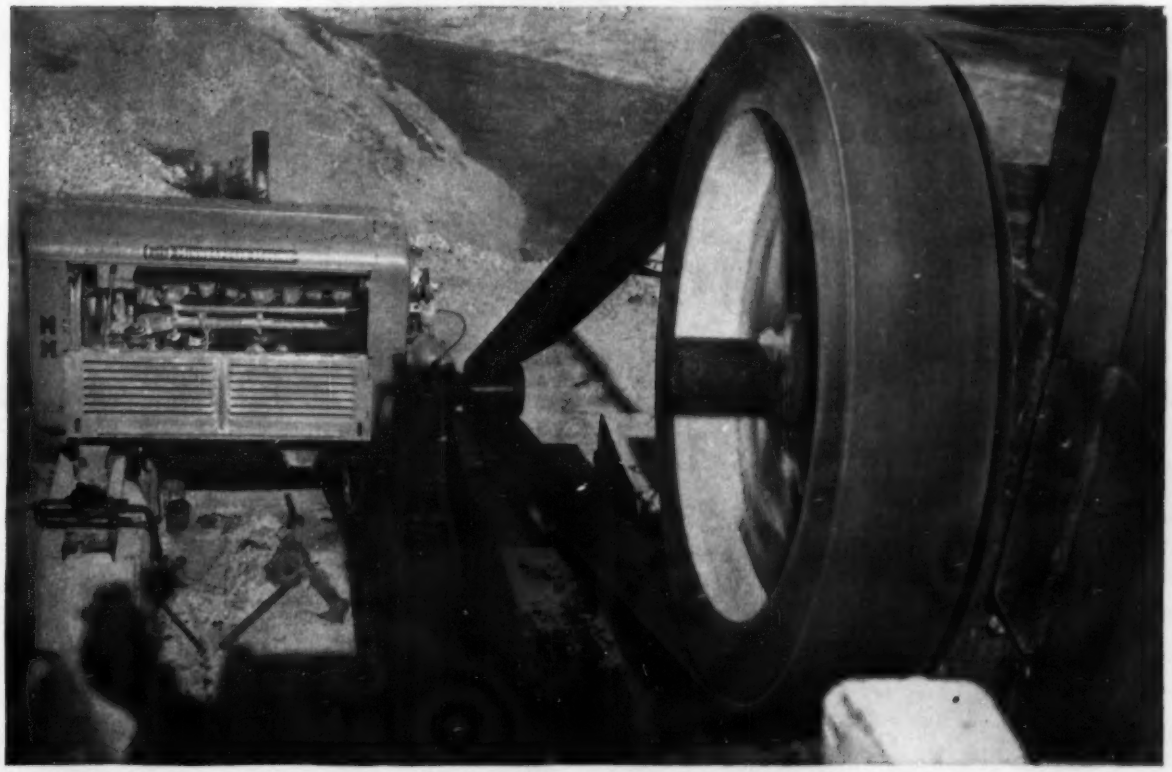
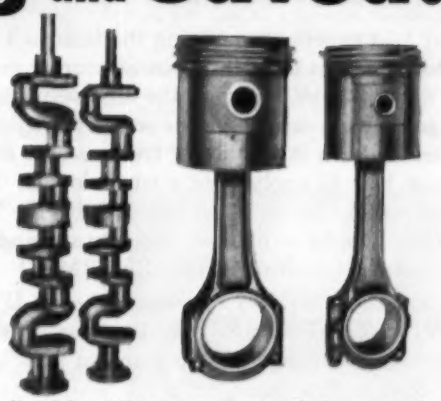


These Crushing Plants Went Shopping and Saved!

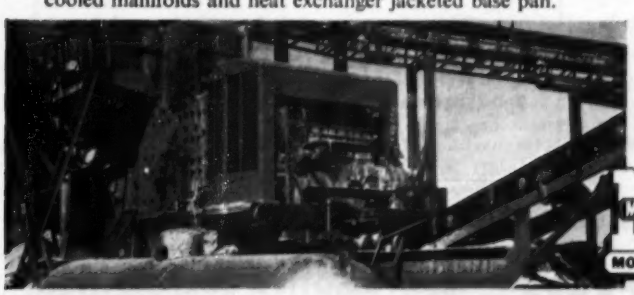
An MM 425-6A LP gas power unit best filled the requirements of this Illinois sand and gravel producer when he went looking for a heavy-duty engine to power roll and jaw crushers. His objective was to get

- **a factory equipped engine for lowest cost fuel**
- **low fuel consumption at maxium power and load**
- **minimum down time and maintenance**
- **convenience of installation and operation.**

The 425-6A more than filled the bill because MM engines are fully and separately designed for gasoline, LP gas, natural gas, diesel, or distillate—MM high turbulence combustion and ample displacement result in high torque at low rpm—long-run features like MM vacuum crankcase ventilation and improved oil filtering require less service—available equipment includes selection of power take-off drives, couplings, rotation and speeds—partial or full enclosures—radiator or cooling coil—choice of location for controls and instruments—electric starter and generator—water-cooled manifolds and heat exchanger jacketed base pan.



Here is how MM part size goes up as displacement and hp go up to supply heavier construction necessary for continuous heavy load operation. Crankshaft, connecting rod, and piston of MM's 108 hp 605-6A engine are shown side by side with those of the next larger MM engine, the 148 hp 800-6A. Size and weight where it counts does the job longer and without strain.



Minneapolis-Moline engines are available from 29 hp to 291 hp, can be outfitted for specialized applications meeting all original equipment and replacement requirements within size ranges. Specifications and engineering service available on request.

MINNEAPOLIS-MOLINE
INDUSTRIAL DIVISION
MINNEAPOLIS 1, MINNESOTA

A New, Time-Saving Experience is Yours

with the

Tractomotive TL-12 TRACTO-LOADER

Our long experience building the famous Tracto-Shovels serves us well in manufacturing our line of wheel loaders. We know the time-saving advantage of the hydraulic torque converter drive from working with it in crawler tractors . . . and we know how to apply it to a wheel loader. That's why you get smooth, fast loading with the TL-12 Tracto-Loader — no slow, mushy starts and stops — torque is multiplied THREE TIMES!

Tractomotive also developed the CLUTCH-TYPE TRANSMISSION in wheel loaders — saves gear shifting . . operator just pulls a lever to change direction.

In addition to these time-saving advantages, you get a TIP-BACK BUCKET which gives you a "scooping action" to further speed loading. This feature also enables you to carry a full bucket at a lower position — means greater stability, easier maneuvering, better visibility.

There is 4-WHEEL DRIVE for excellent traction and POWER STEERING for easy handling under all operating conditions . . . plus high lift and long reach, strong, pin-connected axles, unit assembly of major parts—many performance and service features that save time and money.

It's the combination of advantages that makes the TL-12 an outstanding excavator-loader . . . but the best way to size it up is to see it in action, on your job, under your operating conditions. You will be in for a new, time-saving experience.

The Latest in Loaders...
By the Leader in Loader Design

- **63 Brake hp**
- **Weight 12,100 lb**
- **1⅛ cu-yd Tip-Back Bucket**

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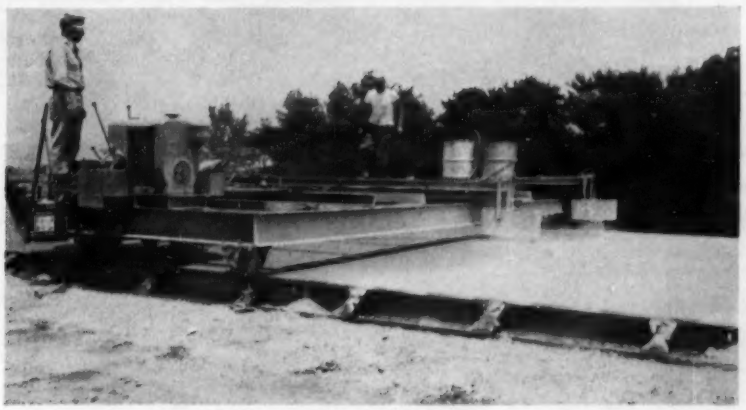
Tracto-Loaders • Tracto-Shovels • Side Booms and Hydraulic Rippers for Allis-Chalmers Crawler Tractors • Loader and Shoulder Maintainer for Allis-Chalmers "D" Motor Grader



ROAD BUILDING MACHINES—A new compacting screed finisher (above, top) features oversized 16-in. screeds, heavy steel channel construction, and exceptional speed selectivity. Available with or without a built-in rubber-tired transportation rig, the finisher is adjustable in widths of 10-15, 20-25, 12-18 ft, or any intermediate 6-ft increment. The finisher is powered with a 32-hp gas engine with six forward and six reverse speeds, plus four independent screed speeds. It is manufactured by a newcomer to the industry, General Road Machines, Inc. They also have on the market a new curing machine (above) powered with a 12-hp gas engine capable of moving the rig at up to 65 fpm in either direction. Two 12-ft spray arms, guarded with windshields, dispense a solution uniformly by swinging out in overlapping arcs. GRM's subgrader, called the Subgrader Planer, is made in two models with telescopic widths of 10-15 and 20-25 ft. Both models have vertical settings up to 16 in., with slotted holes on the grader and positioner blades to allow simple, accurate settings. The GRM Final Finisher is a composite finishing machine designed to follow the final pass of the traverse finishing machine. According to the manufacturer, it is an all-purpose machine that is adjustable to comply with all final finishing requirements with just the one piece of equipment. A unique machine in GRM's new line is its Automatic Curb Builder. By hydraulic activation it mechanically finishes integral roll-type curb and eliminates the need for hand-finishing.—**General Road Machines, Inc., Niles, Ohio.**

LONGER STEEL TAPE — Super Chief a ¾-in. wide, 16-ft long steel tape rule has the extra length and rigidity that comes in mighty handy when making long overhead and reach-in measurements. A flush-folding re-wind crank reels the 16-ft blade in and out of the metal case smoothly and without backlash. Weight with pocket-sized 2½-in. case, 6¾ oz.—**Carlson & Sullivan, Inc., Monrovia, Calif.**

FAST, EASY WAY

TO INSTALL PIPE...

AT LOWER COST

PUSH PIPE UNDERGROUND WITH A GREENLEE HYDRAULIC PUSHER

Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.

GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2189 Columbia Avenue, Rockford, Illinois, U.S.A.

LARGEST YET—Flagship of the new Speedall line of tractor-shovels—featuring power shift transmission—is the 2½-yd unit, the largest yet manufactured. Other sizes include the 1½- and ¾-yd models. The new line of Speedalls has a heavy duty power train which includes, in addition to power shift transmission, a torque converter and four-wheel drive planetary axles. The power-shift transmission, cased in steel, has high-pressure forced lubrication, larger helical gears, ball bearings throughout and nearly twice the clutch capacity of previous models, the manufacturers claim. Two levers on the steering column hydraulically shift the tractor through four speeds forward and four speeds in reverse. Another feature of the transmission is that it has a reversing speed that is 30% faster than for forward motion, a ratio that results in less clutch wear. Large double-acting boom rams, a bucket with 30-deg tilt-up from ground level, and an automatic bucket leveling device are additional features. Either a gasoline or diesel engine is offered with the line.—**Pettibone Mulliken Corp., 4700 W. Division St., Chicago, Ill.**

In Shipbuilding as in other great industries
MILLER WELDERS are preferred

St. Louis Shipbuilding and Steel Co., largest builders of inland towboats in the world, require welds that will withstand a maximum amount of abuse.

Look anywhere in St. Louis Shipbuilding's mammoth yard and you will see Miller Selenium Rectifier type D.C. arc welders—in single units or in batteries of four and five for greater output.

For dependable welds, St. Louis Shipbuilding prefers the Miller S.R. welder. Miller is glad to be aboard.

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Miller Selenium Rectifier type D.C. Arc Welders are available in four wide range models. For complete information on these and other Miller arc and spot welders, contact us today at no obligation, of course.

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APPLETON, WISCONSIN

Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal, P.Q.

LIGHTWEIGHT HEATER—Manufacturers say the Master B-100 portable heater can be used on narrow scaffolds, carried down stairs and through places too small for conventional-size heaters. Said to operate for 12c an hr, the heater has a 100,000-Btu per hr capacity, with a combination fan and pump motor that blows 500 cu ft of air per min. The unit, which weighs 78 lb without fuel, runs from 110-115 v, 60-cycle ac current and burns kerosene or No. 1 or No. 2 fuel oil.—**Master Vibrator Co., 362 Stanley Ave., Dayton 1, Ohio.**

EQUIPMENT PAINT—A chemical-resistant coating called Speed-Rex is available in a wide variety of colors for painting construction equipment. It dries to a glossy finish quickly, making it possible to return equipment to work shortly after it has been painted. The coating is especially adapted to cement handling equipment because it is resistant to the caustic and corrosive effects of Portland cement mixtures.—**Truscon Laboratories, Detroit, Mich.**

SPEEDY ERECTION OF FLORIDA SKYSCRAPER

Powerful, efficient equipment has proved a vital factor in the speedy erection of the 22-story Prudential Insurance Company skyscraper in Jacksonville, Florida by the Ingalls Steel Construction Company. Atop the skyscraper, two American Steel Erector Derricks with 110-foot masts and 100-foot booms handled with ease 5,610 pieces of structural steel weighing 5,893 tons. Two rugged American Double-drum Hoists, set on the second floor of the skyscraper, powered the derricks.

High tensile bolts were used in place of rivets, and the bolting job was completed within a week after the last piece of steel was set. Providing the muscle for high speed handling of materials were two additional American Double-drum Hoists—industry's most efficient hoists.

In rapidly growing Florida, and throughout the world, leading contractors specify American equipment to keep "hurry-up" projects on schedule. For factual, helpful information on American Hoist's line of equipment, backed by 78 years of engineering experience, see your American Distributor, or write American Hoist & Derrick Co., St. Paul 1, Minnesota. 100-3-10

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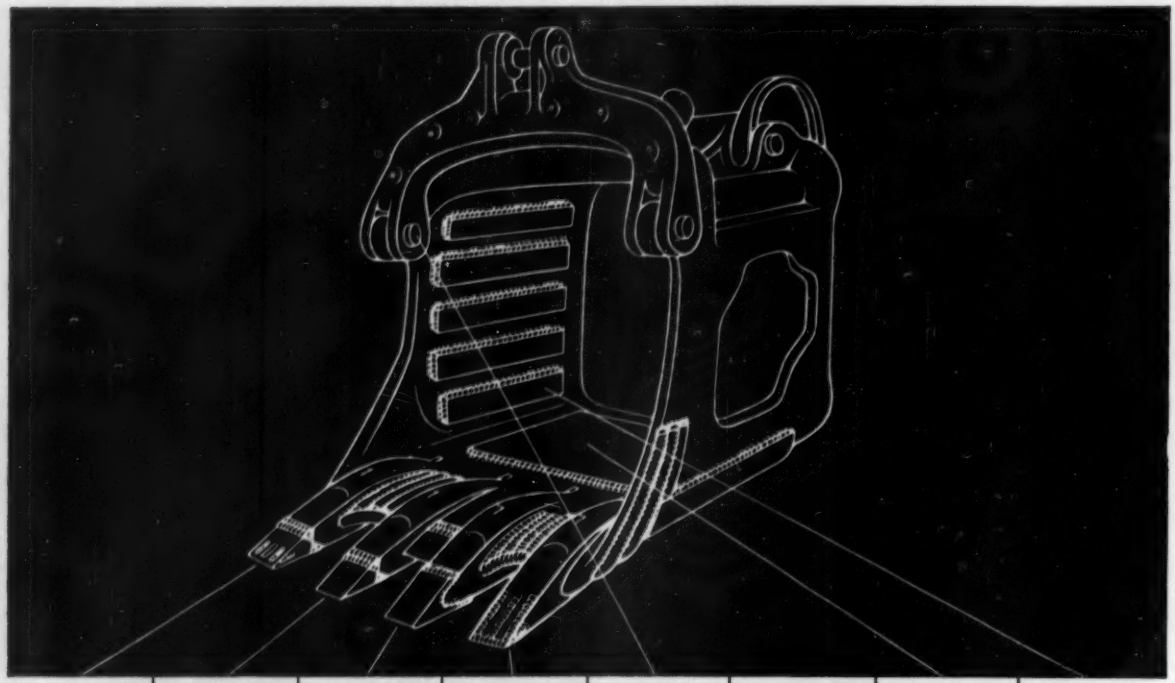
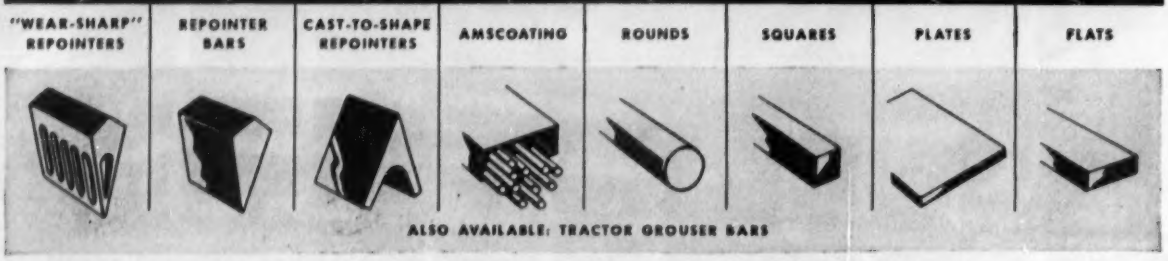
For EXTRA TOUGH build-up and repair





. . . use AMSCO® MANGANESE STEEL

Put manganese steel at the points of maximum wear and operate equipment longer between repair periods. Amsco manganese steel outlasts other steels by as much as ten to one under conditions of heavy impact and severe abrasion.

Impact work-hardens the metal to as high as 550 BHN. Further abrasion only polishes this tough steel. Amsco Bulletin WA-77 will show you how and where you can make extensive savings using Amsco manganese steel shapes. Write for it today.

For immediate savings, contact your Amsco distributor. He stocks a complete line of manganese steel shapes and welding equipment. Welding products are distributed in Canada by Canadian Liquid Air Co., Ltd.

Amsco also produces other alloy steels with maximum wear-resistance under particular service conditions . . . and a complete line of hardfacing welding equipment, both rods and machines.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

INSULATED HARD HAT—A double-purpose hard hat provides protection against falling objects and also against electrical shock or burn. Called the KV, it has no metal in the shell, suspension or chin strap, nor are there air holes in the shell. The shell and the wedges holding the vinyl sweatband are made of Esterene, a plastic. The hat weighs 14 oz.—**E. D. Bullard Co., 275 8th St., San Francisco, Calif.**

EVERY-WHICH-WAY LEVEL—The Gyro-Core level plumbs or levels in any plane. The fluid cavity is barrel-shape instead of the conventional banana shape. Instead of glass vials, internally bored disks are used, eliminating the possibility of vial leakage or breakage. In fact, the level is guaranteed for five years against leakage. The three level disks are mounted in a 48x2½x1 3/32-in. mahogany stick with full angle-corner brass binding.—**Goldblatt Tool Co., Dept Y-21, 1960 Walnut St., Kansas City 8, Mo.**

SAFETY HANDLES—A safety handle for pavement breakers, which the manufacturers claim is the first of its kind, can be fitted to Ingersoll-Rand models. The device was developed as a result of many field requests for a safety handle to be used on tools in connection with demolition work where operators were injuring their hands when working close to walls or projecting masonry. The handle, which weighs 2 lb, is available on the new Ingersoll-Rand PB8A paving breaker, and can be purchased separately for early models.—**Ingersoll-Rand Co., 11 Broadway, New York 4, N.Y.**

H. O. Penn Machinery Corp., New York, cleans Cat DW21's and other big rigs with Malsbary HPC cleaner. What's best size steam cleaner for you? Here's experience of Malsbary users...

Cleaning Load...Your Guide to Best Size Steam Cleaner

For Big Equipment and Tough, Steady Cleaning use a Malsbary HPC (high pressure combination) cleaner as H. O. Penn Machinery Corp. does. This Model 300 HPC cleaner delivers up to 1200 gallons per hour of cold water or hot solution with a 400-lb. impact. It blasts away sticky road tars and imbedded grease in a fifth of the time taken by Penn's previous cleaners. It also supplies hot water and steam for cleaning and degassing tanks, rinsing, de-icing, and thawing. Where work is more than one man can handle, this cleaner operates two cleaning guns simultaneously—one on cold water, one on hot solution.

Trailer mount enables Burns & Dutton to take cleaning right to job.

For Lighter and Intermittent Cleaning Jobs use a Malsbary 110 or 220 steam vapor cleaner as Burns & Dutton Construction, Ltd., Calgary, does for daily cleaning of mixer trucks. Same Malsbary 220 also heats water for winter use and cleans rigs before overhaul and painting.

For Parts and Light, In-Shop Cleaning use the small, new Malsbary 60. It's nozzle controlled, simple as a wrench to use, cuts repair time by eliminating hand wiping of parts. Only $395.

See your Malsbary jobber NOW for the right size cleaner for your needs...or write TODAY for literature on the full Malsbary line.

MALSBARY 73
SINCE 1921 MANUFACTURING CO.
Room C, 845-92nd Ave., Oakland 3, Calif.

Tools that lead a DOUBLE LIFE

cut your cost . . . B&L's the name

Brunner & Lay Tools are ready for the second half of their long life, when the average tools are ready for retirement. There's the extra life of a second tool built into each one. Here's how:—(1) special analysis tool steel (2) scientific heat treatment, all this plus—advanced functional designs to make work easier and/or faster. Put this sort of tool economy into your profit picture. Order today!

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Brunner & Lay Corp.
660 N. Tillamook St., Portland 12, Ore.

Big, heavy equipment, like the heavy Barber Greene trencher above, are easily loaded without the bother of any special skids, cribbing or jacks. ONE man . . . can load or unload, in less than two minutes, by simply driving on or off the tilted platform. Big and broad, this oaked decked platform provides plenty of room, and an extra low climb angle for maximum operator and equipment safety. Construction men everywhere . . . are finding that for faster, safer, between-job hauling of dozers, rollers and other heavy equipment . . . MILLER Tilt-Tops are the ideal trailers. Put a Miller trailer to work on your team . . . you'll find it pays for itself!

Heavy Barber Greene trencher being loaded above, on special, wide platform Model "BT"-10 tandem axle Tilt-Top built for the city of West Allis, Wisconsin.

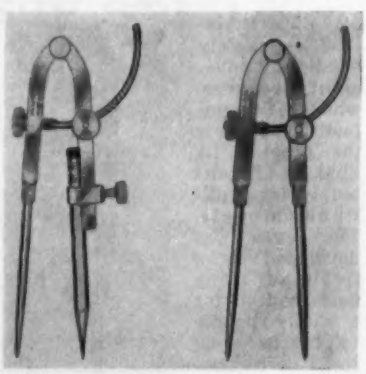
✓ built best
✓ priced best

See your MILLER distributor or write for FREE literature to:

MILLER research engineers — Tilt-Top TRAILERS

457 S. 92nd Street, Milwaukee 14, Wis.

ANALYZES ANTI-FREEZE—A kit selling for only $8.95 will tell you which solutions to hold over for another year and which to discard as dangerous. The analyzer was developed by Du Pont to determine the reserve alkalinity of Zerex, DuPont's ethylene glycol-base anti-freeze. Because the indicator solutions have been compounded to react only with Zerex's formula, the analyzer will not work with other brands, the manufacturers say. Although DuPont engineers believe that only one out of seven solutions of permanent anti-freeze turns acid after one winter, most maintenance men discard a solution after one season. This is because acid corrosion damage to one motor can prove a lot more expensive than buying fresh anti-freeze for an entire fleet. The analyzer kit contains an indicator solution with 100 "control acid" capsules that turn the anti-freeze yellow when the reserve alkalinity is low. It also contains a hydrometer for determining the freezing point of the used anti-freeze, a graduated flask and a stirring rod.—**E. I. DuPont deNemours & Co., Wilmington, Del.**



WING DIVIDERS—Two new dividers are the No. 57 with solid legs for scribing on hard surfaces and the No. 58 with a removable leg replaceable by a pencil. Settings are secured by a full-thread engagment of clamping nut. Fine adjustment is made by use of tension-springed adjusting nut.—**The Stanley Works, New Britain, Conn.**

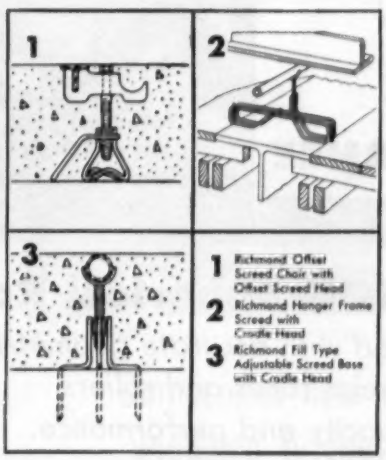
(Advertisement)

Concrete Finishing Problems Overcome with Richmond Screeding Equipment

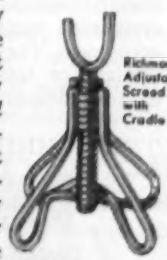
While most concrete work today is thoroughly engineered and scientifically constructed, one of its important phases is often left to haphazard, hand-me-down methods, namely screeding: the finishing of grade floors, runways, roads, decks, approaches, curves, etc. True, the concrete finisher, generally being an excellent craftsman, usually produces a good looking surface. But all too often these surfaces have high or low spots, are not level or of proper thickness, are poorly graded and do not drain properly. This has dire results —particularly when surfaces are exposed to the weather.

Much of the trouble is due to the fact that the screed chairs ordinarily used often do not withstand the loads. Screed chairs serve to support a screed bar or runner at a predetermined position. The bar or runner acts as a guide in striking off the top surface of the slab at its proper elevation and at a proper slope, if a slope is needed. When screed chairs are not properly designed, their legs spread and the screeds misalign and deflect, causing the above mentioned troubles.

These troubles can be eliminated by the selection of screed chairs properly designed for the particular uses for which they are intended—such as the fill-type bases for use where fill requires greater bearing, the sub-grade chair designed for bearing on sub-grade fill, off-set screed chairs designed to take cantilevered loads; and many more. All these are available in the Richmond line of screed chairs.


1
2
3
1 Richmond Offset Screed Chair with Offset Screed Head
2 Richmond Hanger Frame Screed with Cradle Head
3 Richmond Fill Type Adjustable Screed Base with Cradle Head

Richmond's adjustable screed chairs with crossed legs—in wide use by first-line contractors—are fast becoming the most popular. These chairs possess greatly added strength due to the fact that the diagonally opposite legs are not separate, but ingeniously joined and *locked* in place permanently, so that the load is distributed evenly onto all four legs. Since the legs cannot spread, the screeds remain in the position set and the finish produced has no high or low spots, is of even thickness, and level—or properly sloped as intended.



Just how important proper leveling is can be seen, for instance, in bridge work, where the height of the screed bar is often set by surveyors during construction to make sure that the elevations of road curves, bank gradients, etc. are correct. Such leveling to precise dimensions is easily obtained with this Richmond chair. It permits full adjustment of the head up or down, as desired. Once the level is adjusted it will not change. In every way, this chair makes it possible for the contractor to do the job *right*.

Richmond manufactures thirty-four different adjustable supports for screed-finishing. All come with adjustable cradle heads for pipe, flat bar or special shapes, all with top-adjusting combination swivel head for pipe or T-bar.

Write for our 1955 catalogue showing the full line of Richmond-engineered tying devices, anchorages and accessories for concrete construction. It is designed to help you do a quality job *economically*.

If you have a specific problem, Richmond's Technical Division or field men will be glad to solve it for you. Just write: RICHMOND SCREW ANCHOR COMPANY, INC.—816 Liberty Ave., Brooklyn 8, N. Y. or 315 South Fourth St., Saint Joseph, Mo.

IN THE CRUSHED STONE INDUSTRY, TORRINGTON *Bearings are used in many applications including crushers, screens, shovels, cranes, pulverizers, grinding mills and rotary kilns.*

TORRINGTON Spherical Roller Bearings

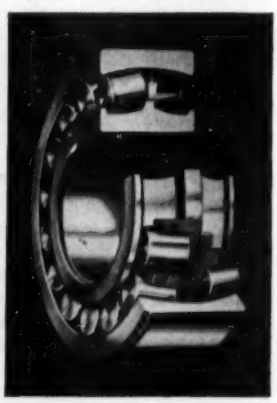
are manufactured with accurate geometrical conformity between races and rollers for ultimate capacity and performance.

Because conformity factors are uniformly high, rollers can operate with a minimum of friction and carry greater loads for a longer time.

There are other good reasons why TORRINGTON SPHERICAL ROLLER BEARINGS can guarantee superior performance. Races and rollers are precision ground to a high surface finish from the finest quality electric furnace steel available.

An integral center flange on the inner raceway gives positive radial and thrust stability against continuous high-speed, high-load conditions. Fully machined, cast-bronze, land-riding cages—one for each path of rollers—allow thorough lubrication, reduce wear and lengthen bearing life.

Specify dependable, rugged TORRINGTON SPHERICAL ROLLER BEARINGS in your equipment. They're available with either straight or tapered bore for shaft or adapter mounting.

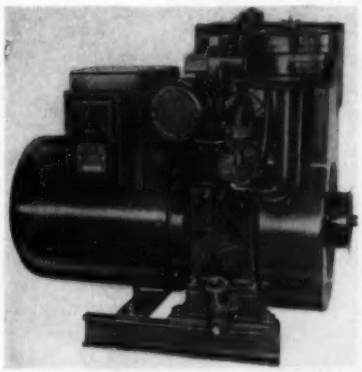


THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

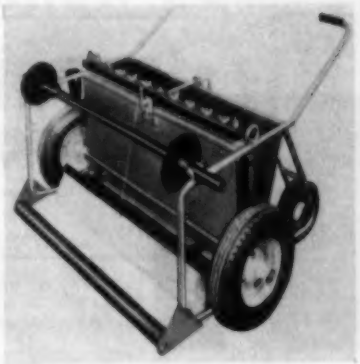


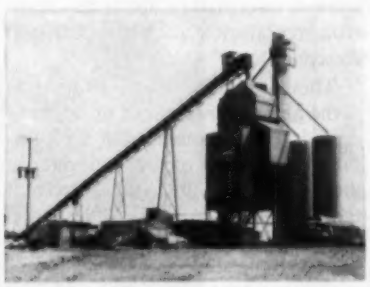
HIGH-OUTPUT ELECTRIC PLANT—Now in production, this entirely new model has been engineered for smaller size and lighter weight than usually available in a full 350 kw unit. Called the model 71-B, the unit is powered by an air-cooled, 1 cylinder gasoline engine close-coupled to the large generator. The 110-220-v ac set is 60 cycles single phase. It measures only 26 in. in length and weighs only 240 lb for manually starting models.—**Universal Motor Co., Oshkosh, Wis.**

EQUIPMENT-REBUILDING ELECTRODE—The new Mir-O-Col 13-S is designed for high speed rate of deposit on heavy-duty equipment such as grader blades, shovel bucket lips and similar hard-working equipment. The new electrode will deposit at least one-third more metal than conventional electrodes, it is claimed, thereby allowing a substantial time and labor saving. The electrode is available in a full range of sizes.—**Mir-O-Col Alloy Co., Inc., 312 N. Avenue 21, Los Angeles 31, Calif.**

SOLDER GUN—A new instant solder gun heats within a few seconds without the use of a heavy transformer of fragile thermostats. It weighs only 8 oz compared to 40 for comparable transformer types. It is claimed the lifetime alloy tip cannot wear, corrode or bend, thus eliminating tip maintenance. Trigger control gives any degree of heat required without the danger of overheating. Rated at 150 w, ac or dc.—**Hexacon Electric Co., 532 W. Clay Ave., Roselle Park, N. J.**

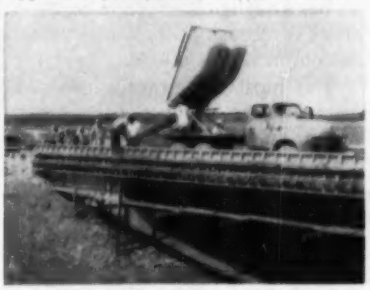
ONE-MAN FELTLAYER—The new Aeroil FL-36 feltlayer has a ball bearing switch-over handle that controls the outlet valves and at the same time raises and lowers the sweeping mop while the spacer plate keeps the felt aligned for proper laying. With this feature, and because of the balance of the machine, one man can operate it, according to the manufacturer. The unit is tricycle-mounted on rubber tires, has a 23-gal tank, weighs 155 lb, and is 54-in. wide. Each of the 10 valves can be independently adjusted.—**Aeroil Products Co., Inc., South Hackensack, N. J.**





1. Central plant produces 3 types of mixes

2. Dumpcretes haul 4 yds. to paving site



3. Same truck with different mix for bridge

4. Access road widening gets this 4 yd. load

Dumpcretes haul concrete for paving, widening, bridges on Ohio Turnpike

D. W. Winkelman's simplified concrete operation on the Ohio Turnpike has created a stir of interest among paving contractors. With central-mixing and Dumpcretes he produced and hauled concrete for paving a 10-mile section . . . for widening access roads . . . and for bridges, retaining walls and other structures. This method allowed pours on many of these jobs to be made at the same time with concrete produced by a single plant . . . and eliminated pavers, water trucks and the men to run them. The same method cuts costs on small jobs, too. Write for job reports.

MAXON DUMPCRETE

Fastest from plant to pour

Send Me ☐ Concrete for Paving and Structures on Ohio Turnpike ☐ Job Reports on Low Cost Non-Agitating Hauling of Concrete

Name _____

Firm _____

Street _____

City _____

Manufacturing Division, Maxon Construction Co., Inc., 717 Talbott Building, Dayton 2, Ohio

(Advertisement)

Darex Diary

No. 5 of a series

by Henry L. Kennedy

Member, American Concrete Institute

Manager, Construction Products
Dewey & Almy Chemical Company

*Why air entrainment makes better concrete blocks

*Abrasion resistance of air entrained concrete

TALKING WITH PEOPLE about concrete blocks, some of them have said to me, "When you add an air entraining agent to the concrete block mix, I should think it would make the blocks *lighter*. Is it true that the block actually may be heavier?" The answer is that when the optimum amount of DAREX AEA is present, the resulting block will be *denser* – and therefore slightly heavier than the block made without AEA. Furthermore, it will be stronger.

The reason is relatively simple when you consider that concrete blocks are made from a harsh, dry mix that does not flow into place readily. The effect of the right amount of air entraining agent is to create a great many tiny air bubbles that serve as "ball bearings". They help the mix flow into place and against the form faces, giving better compaction and consolidation in the machine. A denser block results . . . such blocks have sharper corners and edges, with smoother texture on all faces, and lower absorption.

The maximum consolidation which takes place when the correct amount of DAREX AEA is used, often permits the use of a little more water without slumping than could be used in the absence of air entraining agent. And, as you probably know, a little more water added to an overdry, tamped mix will result in higher strengths.

* * * * *

Not long ago, we received a call from a Maine contractor about a job where he had used DAREX AEA concrete to get maximum resistance to freezing and thawing. He had just learned that this concrete would also be subject to severe abrasion, and he wanted information about the abrasion resistance of air entrained concrete.

There is one fact that is irrefutable – the abrasion resistance of *any* concrete is a direct function of the compressive strength of that concrete. In the case of air entrained concrete, if the air content is below 6%, and if the mix ingredients are reproportioned so that the cement content remains constant, then the entrained air has a negligible effect on the properties of abrasion resistance as well as compressive strength.

The most important single procedure to be watched is to assure proper curing of the surface. If the concrete is improperly cured, you will have poor abrasion resistance, air or no air. A good, uniform curing compound like DARASEAL will assure maximum hydration of the cement, producing a high degree of strength, with attendant surface hardness, as will other methods which assure proper curing. Of course, if you use a metallic or any emery floor hardener, the abrasion resistance will be even higher than the strength factor of the concrete indicates. But the concrete surface must be properly cured.

There has been some demand for a test method to determine the abrasion resistance of concrete. Subcommittee IIIM of Committee C9 of ASTM has been studying this problem for several years. Progress is being made and it is hoped that a test method will be available by this time next year.

DEWEY and ALMY CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO., Cambridge 40, Mass.

Offices or Subsidiaries in principal U. S. cities
and in Buenos Aires, Copenhagen, London, Melbourne, Milan, Montevideo, Montreal, Naples, Paris, São Paulo, Wellington.

FOR SINGLE AXLE TRACTORS—A new trailer dump for operation with single rear axle tractors is designed for materials handling in localities where the law allows high individual axle weight limits combined with relatively low gross weight. Model SSM Transporters are available in body lengths from 16 to 20 ft, with payload capacities from 10 to 20 yd. They are equipped with rear mounted model 77142 Duo-ram hoists with 18-ton capacity. The manufacturer's idea is to combine strength with minimum weight. Ten-gauge steel is used throughout the body and closely spaced 4-in. channel crossmembers are welded to 6-in. I-beam longitudinals.—**Galion Allsteel Body Co., Galion, Ohio.**

CRAWLER-LOADER—A new loader unit, the 12 WI for the OC-12 tractor is a 1¼-cu yd capacity machine with wide control that permits digging to a depth of 30½ in. below grade. The bucket on this loader has an unusual amount of rollback—37 deg—that makes it easier to take and carry big bites with less spilling. The extra rollback allows loads to be carried closer to the tractor, reducing the leverage and ballast required to counterbalance the tractor. Maximum dumping height at bucket hinge is 10 ft, 4 in. The tractor is available with 45.1-hp gasoline or 44.3-hp diesel engine. The unit is equipped with differential steering that keeps power on the tracks at all time.—**Oliver Corp., Dept 21, 400 W. Madison St., Chicago 6.**

Wolverine Contractors know how to get more work out of equipment—use STANOLUBE HD-M Motor Oil

Norris Host (right), President of Wolverine Contractors, Inc., and Robert Larsen, Standard Oil automotive lubrication specialist, talk lubrication on job site. Customers of Bob's like to talk lubrication with him. They know it can pay off for them in better, lower cost operation of equipment. Bob's seven years' service with Standard Oil gives him a solid background of experience for this sort of work.

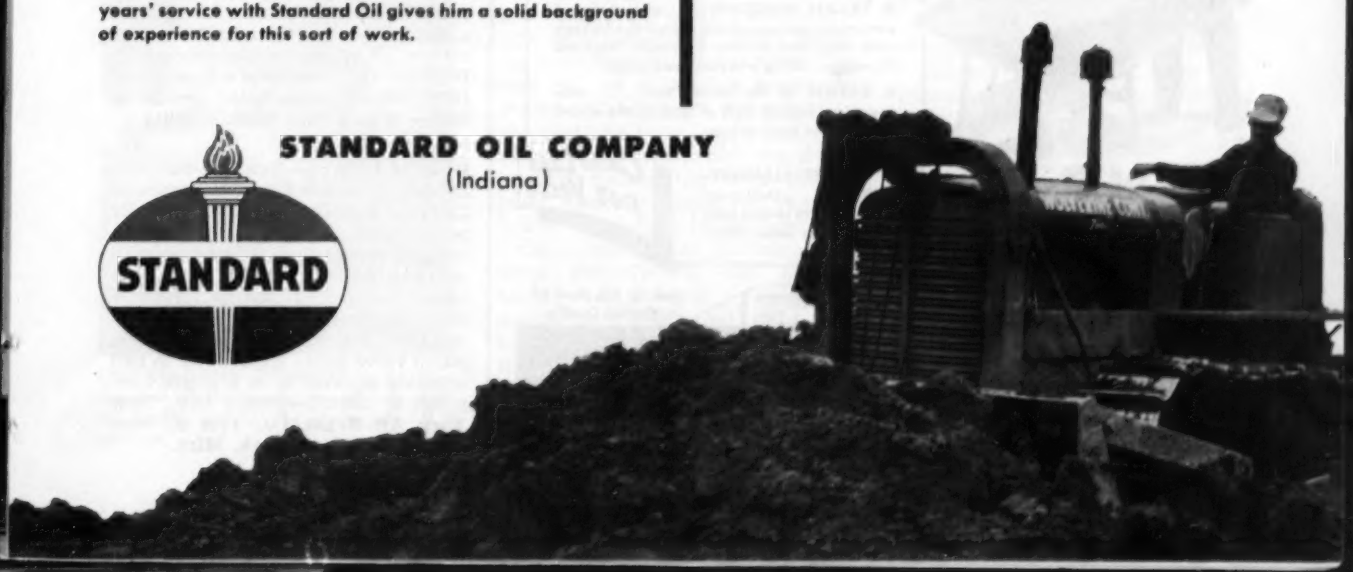
Wolverine Contractors, Inc., Detroit, know that good maintenance begins with good motor oil. They have used STANOLUBE HD-M Motor Oil for many years in both gasoline and diesel equipment. On overhauls, engines come down clean and free of sludge. These are the reasons STANOLUBE HD-M delivers this clean, sludge-free performance:

1	STANOLUBE HD-M Motor Oil is refined from high quality base stock.
2	Additives exclusive with STANOLUBE HD-M retard oxidation of the oil, reduce formation of piston and ring belt deposits.
3	These additives in STANOLUBE HD-M prevent fuel from forming varnish and sludge.

STANOLUBE HD-M makes the maintenance job easier for maintenance men by: extending periods between overhaul; making the overhaul job easier when it is done; reducing wear and eliminating corrosion of bearing metals. STANOLUBE HD-M Motor Oil makes the construction job more profitable for the contractor by helping him get more operating hours out of equipment.

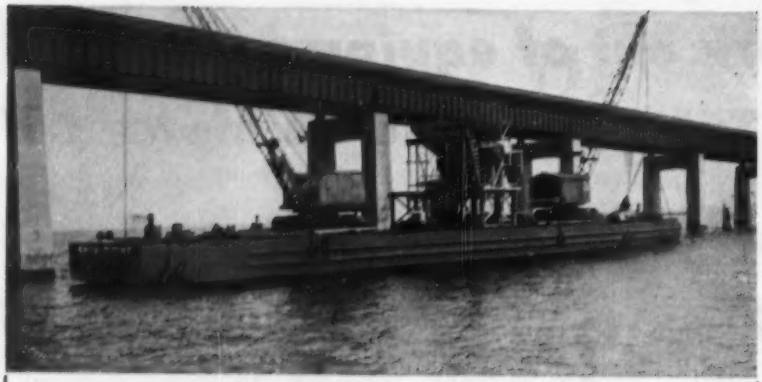
Get the facts about STANOLUBE HD-M Motor Oil. Get in touch with your Standard Oil automotive engineer. In the Midwest call your nearby Standard Oil office. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Dozer helps with grading on Wolverine Contractor project. As with all equipment Wolverine operates, this dozer gets Standard Oil lubrication exclusively.



STANDARD OIL COMPANY
(Indiana)

STANDARD



Typical Hughes steel scows carry bridge girder direct to site of erection.

EXTRA LARGE STEEL SCOWS for CHARTER

Hughes No. 100	135' x 50'
B. H. No. 3	200' x 34'

Contractors: Consult us about work boats, tugs, scows adaptable for derricks, etc., when making up your next bid. We have over 60 years' experience in chartering and selling floating equipment.

HUGHES BROS., INC.

17 Battery Place, Tel. WHitehall 4-1048, New York 4, N. Y.

CLEARING HOUSE FOR MARINE DIFFICULTIES SINCE 1894

Why STERLINGS are MAN'S BEST Materials-Handling FRIEND!

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1. **ALWAYS READY** to use . . . no fuel or other "operating supplies" needed.
2. **NO "STARTING"** Problems . . . regardless of cold, heat, rain, dust.
3. **NO "HOUSING"** Problems . . . no protective warehousing needed, no covering, no "babying".
4. **NO MAINTENANCE** Problems . . . nothing to get out of order . . . rugged, long-lasting.
5. **EASIEST WHEELING** . . . with choice of pneumatic, semi-pneumatic or steel-tired wheels (with plain, ball or roller bearings.) These are the easiest rolling wheelbarrows made!
6. **EASIEST** on the barrow man . . . engineered to balance 4/5th of load on the wheel; only 1/5th of load at handle grips.
7. **EASIEST CLEANEST-DUMPING** . . . steel trays engineered to unload completely, with least effort.

Costs Less per Year

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

TRACTOR GENERATORS—"Electricity on Wheels" is the title of a new publication describing a new mobile-power generator for tractors. Designated GEA-6400, the 12-p bulletin outlines the operation of the generator and lists its range of uses, including field floodlighting, power sawing, welding and electric spraying.—**General Electric Co., Schenectady, N. Y.**

ENGLISH ROAD BUILDING—The second edition of Road Note No. 7, dealing with materials for filling and sealing joints in concrete roads, is now available. The booklet describes the types of joint in use in England and the methods of sealing them against water and grit. Price is 27c.—**Her Majesty's Stationery Office, Road Research Laboratory, 5-11 Regent St., London.**

OLIVER CRAWLER—The OC-3 is described in a 16-p bulletin that illustrates applications of the handy little machine and lists important specifications.—**Oliver Corp., 400 W. Madison St., Chicago, Ill.**

EUCLID TC-12—The two-engined, 388-hp, Torqmatic Drive Euclid TC-12 is described in a 4-p, four-color catalog released by **Euclid Div., General Motors Corp., Cleveland 17, Ohio.**

HUBER-WARCO CO.—A 12-p bulletin describes the 5D-190 motor grader, said to be the first to offer as much as 195 hp. The bulletin includes action photos and diagrams, cross-sections and specifications for features of the grader. A special section illustrates the machine's cab-controlled 90-deg blade movement. Bulletin is available from any Huber-Warco distributor or write **Huber-Warco Co., Marion, Ohio.**

DUDCO PUMPS—New 4-p bulletin, DP-308, describes the PF100 series of 2,000-psi variable delivery hydraulic power units as double pumps with integral valve panels. Illustrates with cutaway drawings construction features, dimensions and performance data. Schematic piping diagrams are included for installing the double pump valve panel units either in two separate systems or in a single two-pressure circuit.—**Dudco Div., New York Air Brake Co., 1700 E. Nine Mile Road, Hazel Park, Mich.**

(Advertisement)

New Rotary Trowel enters field

"What we need is a really rugged trowel, one that can't get away from you and crack up", said one veteran concrete man when interviewed.

Because Stow Manufacturing Company, makers of concrete vibrators and screeds in Binghamton, New York, decided to make a Rotary Trowel, an exhaustive study was conducted to find out what concrete men wanted in a Rotary Trowel. Stow knew they were getting into a field where competitive manufacturers were well established, and that they had to come up with a machine that would be superior to any other on the market.

Thousands of dollars were put into the design and perfection of the Stow Roto-Trowel. The result: the G-34 Roto-Trowel; a rugged, safe, easy-to-handle machine that trowels smoothly.

Probably the most outstanding feature on the G-34 Roto-Trowel is the stationary guard ring, instead of the conventional rotating type. With the rotating type guard ring, the operator must be extremely careful whenever he works near walls and obstructions; if the ring should touch any object, it could wreck the trowel and injure the operator. With the Stow Roto-Trowel's strong stationary guard ring, the operator can trowel much closer to walls and obstructions with no fear of accidents.

Another feature, the squeeze-type dead-man control on the hand-grip, stops the trowel blades the instant the operator releases pressure; however, the engine continues to operate, eliminating the necessity of re-starting the engine. This is an important safety device, because it eliminates clutches, which sometimes become faulty and grab, causing serious accidents plus the expense of a new clutch.

THIS DEAD-MAN CONTROL on the wide cross-bar of the handle immediately stops the machine, but not the engine, when it is released.

STOW ROTO-TROWEL FINISHING A SUPERMARKET FLOOR. Before trowelling, a Stow screed was used to strike-off the surface. By screeding and using a 1" slump concrete, the concrete set up so fast, they were able to put the Roto-Trowel on the job only 1 hour after screeding.

The Roto-Trowel's dead-man control is fool-proof; it works by tightening an idler pulley against the belt drive. Releasing the lever loosens the belt, immediately stopping the rotating blades. With this type of drive, the operator can throttle the trowel down from 100 RPM to 25 RPM where special conditions require slow speed.

The Stow G-34 Roto-Trowel is powered by a 2½ HP gasoline engine which supplies ample power for even high slump concrete. The unit has an adjustable handle so the operator can set the height to his most comfortable operating position. This feature, plus the wider handle, makes the Roto-Trowel much easier to maneuver, regardless of the height of the operator.

On a construction job where one Stow Roto-Trowel was put in among competitive trowels, the contractor discovered that his trowel operators were actually arriving on the job early each day in order to use the Stow Roto-Trowel. They found it much easier to handle.

A hook mounted on top of the engine makes it easy to lift the Stow Roto-Trowel to higher levels. A knob on the handle controls blade pitch while the machine is running. All three blades fit into recessed slots to insure correct seating; each is secured by a hand-turned wing nut for quick changing. Float blades are 10x14 inches; finish blades are 6x14. Both blades are made of special wear-resistant steel and can be reversed for double life.

The G-34 Roto-Trowel, complete with a set of float and finish blades, weighs 143 lbs.; sells for $375.00 F.O.B., Binghamton.

A 34-inch electric trowel is also available with a 1½ HP motor.

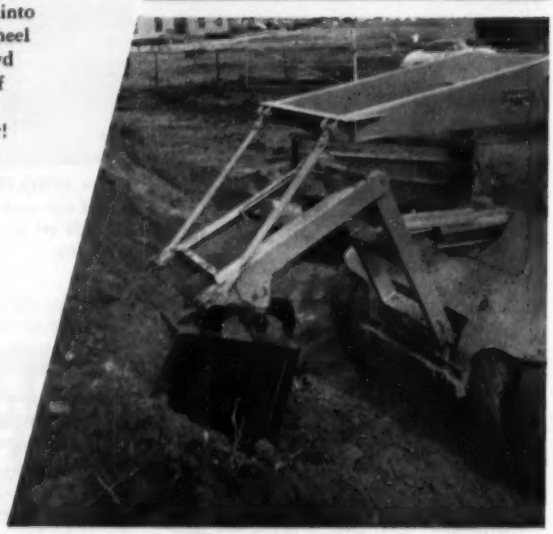
Contact your nearest Stow Distributor for a demonstration, or write Stow Manufacturing Co., 31 Shear St., Binghamton, N. Y. Ask for Stow's complete catalog on Concrete Vibrators, Portable Concrete Grinders and Vibrating Screeds, and Rotary Trowels.

STOW MANUFACTURING COMPANY
31 Shear Street
Binghamton, New York

Originators of the Flexible Shaft

Dempster-Diggster bucket GETS A FULL LOAD WITH EVERY STROKE!

The hydraulic crowd and hoist operation of the new Dempster-Diggster GRD-101 gives you big shovel advantages in front end loading and excavation work. As shown in the at-work photos at right, here's what happens: Dempster-Diggster moves into material with shovel lowered against front of frame. No wheel traction is used to get excavation power. The hydraulic crowd and hoist moves bucket out and up following contour of material—getting a full bucket with every stroke . . . reducing loading time and idle truck time, thus getting the job done faster!



When you put your Dempster-Diggster into operation, one of the first things you will find is that your entire operation must be geared to a faster pace. This means greater efficiency of equipment and manpower—more profit to you!

Write us asking for Folder No. 3116 giving you complete information on the features of the Dempster-Diggster, including TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MAXIMUM DUMPING AND DIGGING HEIGHT . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING, etc. Manufactured by Dempster Brothers, Inc.

In photo below camera catches Dempster-Diggster ready to back off and move up to a truck for loading.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS 395 SHEA BLDG., KNOXVILLE 17, TENN.

DIPPER TEETH — To aid power-shovel users in picking the right repointer style for dipper teeth, a revised guidebook, WA-77, incorporates latest developments in repointer design and welding rods for attaching or hard-facing the teeth. Copies may be obtained by writing to Ed Wegerson, **American Manganese Steel Div., Chicago Heights, Ill.**

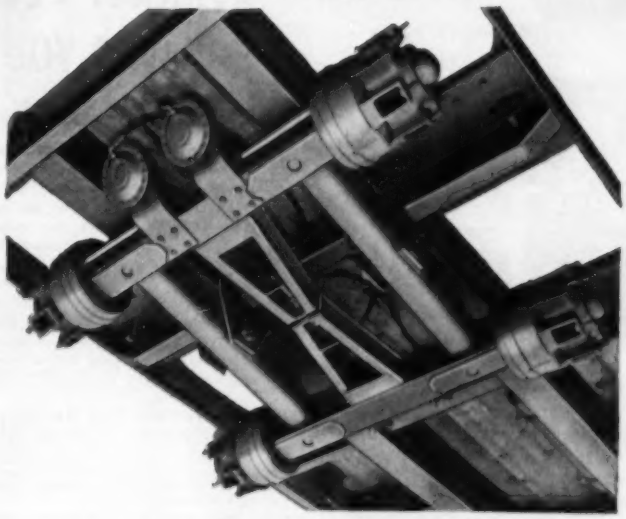
HAND PUMPS—The Blackmer Rotary Hand Pumps line is described in a new 4-p bulletin, showing the basic pump styles, as well as accessories for various applications. Included is a detailed discussion of the full line, including performance features, application information and other data. Request Bulletin 320 from the Sales Dept., **Blackmer Pump Co., 1809 Century, S. W., Grand Rapid, Mich.**

ALUMINUM CONDUCTORS—Technical Advisor No. 28, devoted to aluminum used for electrical construction details the latest approved methods for joining aluminum wire, rod, bar shapes and cable used in electrical systems. It covers soldering, brazing, welding, pressure connectors, etc. A question-and-answer section presents data on such items as determinations of cross-sectional area required for a given current, methods of calculating area of aluminum bus to replace copper, the relationship between cold work done on aluminum and resulting tempers and tensile strengths. The publication points out that electrically a pond of aluminum equals 2 lb of copper. And with aluminum priced lower than copper per lb, it is evident that there are possibilities for cost savings.—**Reynolds Metals Co., Box PR, 2500 S. Third St., Louisville 1, Ky.**

TRENCHER—Model 60 Trencher is described by the manufacturer as being able to dig, clean, smooth trenches up to 5 ft deep at 300 ft per hr. The claim is made in their new bulletin No. 60. Illustrations show closeup views of the hydraulic drive-on conveyor, the belt slip clutch, the independent hydraulic system and the bucket line. An interesting sequence of cartoon line drawings points out the benefits of the trencher. Also included are complete specifications for the machine. —**Earth Equipment Corp., 2036 Sacramento St., Los Angeles 21, Calif.**

CURTAIN WALLS—A new 20-p brochure fully describes the new techniques and improved equipment used to field-assemble insulated metal curtain and sandwich walls. Included are photographic, and line-drawing descriptions of the processes and equipment. Published by the **Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, Ohio.**

Life-time Parts Service



...exclusive with LaCROSSE TRAILERS

To insure quick service on emergency repairs, every working part used in LaCrosse trailers is job-numbered for your protection. From this indexed record, any part for any trailer we have built during the past 23 years, can be supplied on short notice. You get *one day service on current parts . . . one week to ten days for parts for non-current models.* This fast life-time parts service, combined with LaCrosse's superior "engineered quality", means extra years of low-cost trailer performance. See your LaCrosse distributor for latest facts on dependable LaCrosse low-beds — from 6 to 75-ton capacity — with flat, drop or tilting platforms.

More LaCrosse
Plus Values

- **Special heat-treated steels** for extra strength, minimum weight.
- **One-piece main beams** with patented formed gooseneck for extra ruggedness.
- **Frames positioned for "down-welding"** to insure stronger, more uniform welds.
- **Specially engineered** H-Beam axles, boxed to withstand brake torque.
- **Axles cambered 1/8"** to reduce tire wear.
- **Bigger 5-Cam brakes** for faster, safer stops with reduced lining wear.
- **All parts shot-blasted** to remove mill scale, rust and weld slag.

CHECK TODAY! **LaCROSSE TRAILER CORPORATION, LaCrosse, Wis.**

☐ Rush complete information on LaCrosse trailers:
☐ Specifications ☐ Prices ☐ Delivery
☐ Send name of nearest LaCrosse Distributor.
☐ We may buy a.... ton trailer about..... date

Name..... Title.....
Employed by .....
Address .....
City ..... State.....

LaCROSSE LC-55
AMERICA'S FAVORITE LOW BED TRAILER

HOW the MADSEN 2000-LB. SPECIAL ASPHALT PLANT SAVES YOU MONEY!

Owning and operating a MADSEN 2000-lb. SPECIAL Asphalt Plant can actually be an experience in saving money! This plant's fast set-up and take-down time saves you money. It costs you less to operate and less to maintain. And, its fast operation and high production save you money by helping you make more money. Yes, in an asphalt plant you will find the MADSEN 2000-lb. SPECIAL one of your soundest investments for saving and making money!

HERE ARE A FEW OF THE MADSEN FEATURES AND ADVANTAGES WHICH MAKE THE 2000-LB. SPECIAL ONE OF THE INDUSTRY'S LEADING SMALL-CAPACITY ASPHALT PLANTS:

- Plant is completely portable — quickly and economically set up.
- Is efficiently operated with a minimum crew.
- Simplified unit-power source operates entire tower unit.
- Engineered and built for compactness and maximum efficiency.
- Has press-broke steel columns and legs for increased accessibility without interference.

See your MADSEN Distributor today for all of the facts.

MADSEN Equipment that Serves

MADSEN WORKS
CONSTRUCTION EQUIPMENT DIVISION
Baldwin-Lima-Hamilton Corporation
14120 E. ROSECRANS AVE., P.O. BOX 38 • LA MIRADA, CALIF., U.S.A.

BLH Construction Equipment Division

Elis SHORES

Provide the Needed Height Adapability For Pensacola Airplane Hangars

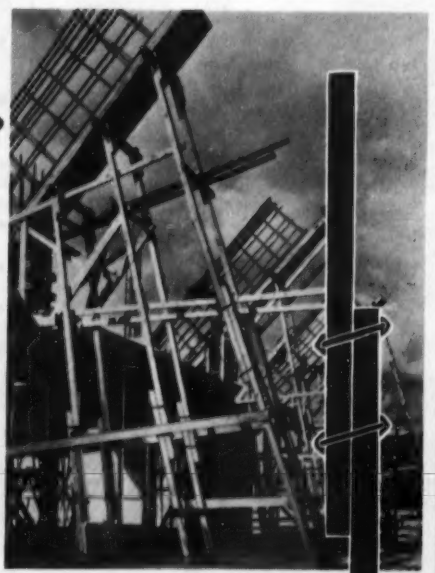


Photo shows arch work just begun in the construction of a typical large size airplane hangar.

Varying height requirements are easily met on this Pensacola, Florida job—with no waste of forming lumber! Elis standard seven-foot lower shore members, with upper members of desired length are adaptable to all conditions. You can nail into Elis Shores at any point, so that horizontal and cross bracing is easily and inexpensively done, and all forming lumber is re-usable on other parts of the job. For forming arches or any other concrete work, Elis Shores do the job better!

MFD. BY ELIS EQUIPMENT CO., INC., 211 N. W. 4th ST., OKLAHOMA CITY, OKLA.

BUFFALO-SPRINGFIELD—An illustrated, 8-p booklet discusses the four-wheel K-45 Kompactor. Each of the K-45's four roller wheels is faced with staggered rows of heavy steel pads that form the compacting surface. The booklet includes specifications on engine, transmission, wheels, dimensions and compressions. — **Buffalo-Springfield Roller Co., Springfield, Ohio.**

CATERPILLAR POWER—The new line of small size, high capacity Cat diesel electric sets is described in "Modern Electric Power," a 4-p booklet. The booklet discusses the advantages of matching the small generator sets with Cat engines for maximum efficiency. — **Caterpillar Tractor Co., Peoria, Ill.**

MAGINNIS PRODUCTS—Concrete vibrators and multi-purpose generators in the Hi-lectric line are illustrated in a 6-p catalog recently released. Condensed specifications, accessories, and suggested uses are discussed in the catalog, available at local Maginnis distributors or write to **Maginnis Power Tool Co., 154 Distl Ave., Mansfield, Ohio. (Catalog LL-1231).**

CANADIAN ASPHALT—A "textbook style" catalog on asphalt mixing plants includes information on hot-mix, batch and portable types. Published by an Ontario firm, that manufactures and designs asphalt plants, the 16-p technical bulletin has more than 40 photographs, and charts, contains a description of all components of a modern asphalt paving plant. — **Koehring-Waterous Ltd., Brantford, Ont.**

BARBER-GREENE—A recently issued, 8-p, two-color folder describes the operational features of their Model 894, 4,000-lb BatchOmatic bituminous batch-plant. Included is a discussion of the new Dyna-Mix pugmill, which the manufacturers claim, mixes thoroughly in less time than any other pugmill of comparable rated capacity.—**Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.**

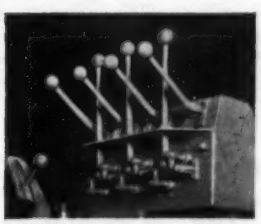
Sorry . . .

IN THE CHART listing specifications for motor graders, on pages 74 and 75 in our August issue, the frame weights for the Galion machines are incorrect. The correct weights are shown in the accompanying box. We suggest you cut it out and paste it in place on the original chart. It should cover lines 19 through 23 (GALION) in the column headed FRAME, Wght Per Ft, Lbs.

116.2
115
115
51.1
52.6

15-ton MICHIGAN TLDT-20 at work near George Washington Bridge, N.Y., N.J.

Air controls mean more profits . . . with this MICHIGAN 15-ton truck crane



It's faster: AIR CONTROL

For smooth swing, for perfect "feel" of the load, MICHIGAN air control has no equal. It cuts operator fatigue.

It's smoother: DISC CLUTCH

For positive action — smooth, and as fast or slow as you want — the MICHIGAN air-controlled clutch is ideal. Self-ventilating, self-cleaning — and interchangeable segments make easy servicing.

A few years ago, only heavy off-the-highway trucks had power-steering. Today, power-steering is practically standard equipment on all passenger cars. Similarly in the excavator-crane field: almost all big machines (1 yard and up) have long been power-controlled. But of ten leading ½-yard machines on the market today, *only three have power-controlled clutches.*

Now consider this: Air-controlled clutches have always been standard on all Michigan® excavator-cranes. Easier to operate and easier to maintain than old-fashioned mechanical levers and linkages, Michigan air controls give you faster production with less maintenance. In short, more profitable operation.

The Michigan TLDT-20—½-yard 15-ton truck crane—features air controls as standard equipment, along with other "big machine" features: 6 adjustable hook rollers, integral-cast turntable deck and sides frames, heavy-duty 404 cubic inch truck engine. The TLDT-20 is described in detail in Bulletin 1600A; write for it and make your own comparison. Or ask your own Michigan distributor to show you, on-the-job, how the TLDT-20 can boost your profits.

ALL Michigan equipment is available on a low-cost, no down-payment Lease Plan; write for 4-page folder which explains how it works, how much it costs, etc.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
380 Second Street, Benton Harbor 32, Mich.
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ONE HAND CONVENIENCE

for fastening to steel or concrete

Ramset® FASTENING SYSTEM

SPEEDS WORK ON LADDERS & SCAFFOLDS

+

other Ramset exclusives:

- FAST CHANGEOVER for light, medium, heavy duty
- JOB-MATCHED SYSTEM— exactly the fastener you need
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- NEARBY SERVICE whenever or wherever you need it
- FASTENING LEADERSHIP keeps Ramset FIRST in the field

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Ramset Fasteners, INC.

RAMSET DIVISION—OLIN MATHIESON CHEMICAL CORPORATION

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SAFETY PROGRAM PAYS OFF . . .

Continued from page 112

estimate that this facility has saved at least 2 hr of lost time for each case handled. But more important than the dollars and cents involved is the effect the medical station has upon job morale.

Two full-time nurses operate the station under the supervision of a doctor, who spends 2 or 3 hr a day at the site. The workers like the medical personnel, and they also like the feeling that they are there for the prompt care of any injury—that the company does give a hang about their welfare.

Nurses Aid Morale

We were very careful in the selection of the nurses. They had to be not only competent and efficient, but personable and attractive as well. They wear slacks on the job, not white uniforms, and they're not afraid to scramble around the job to aid an injured workman. The workmen recognize this, and a feeling of comradeship has evolved. The result: Workers have faithfully reported every accident, and we catch small injuries before complications set in.

The medical department keeps a full record of all accidents. Because our medical facilities are on the job site, it is a lot easier to give follow-up treatment. Our medical department also acts as an advisory facility where workers can come in and discuss non-occupational illnesses and be referred to outside doctors.

Well-Rounded Program

To sum up, the safety program for Socony-Mobil seeks to prevent accidents in three ways:

First, we established safe procedures while the job was still in the design stage. Management recognized that safe operational procedure and good operational procedure really mean the same thing.

Second, we made use of protective devices and equipment, such as guard rails, hard hats, goggles and safety shoes.

Third, and equally important, we impressed upon the worker the fact that safety is part of his job. He has recognized that something can, and is, being done to make his job a safe one. With this attitude, we feel confident that the Socony-Mobil safety record will continue to be an impressive one.

Save 5¢ to 15¢ Per Sq. Ft., Every Pour, with Compo Forms

What makes costs so high on so many concrete forming jobs? Usually it's:

1. Handling, fitting and stripping heavy, cumbersome forms.
2. Excessive finishing because of wide form crevices and large tie holes.

Modern, money-saving forming is done with Atlas Compo Forms. *Light* (they average less than 5 lbs. per square foot) — a man can handle more in a day. *Fast* — they have the simplest tie system ever developed. *Accurate* — only minimum finishing is required.

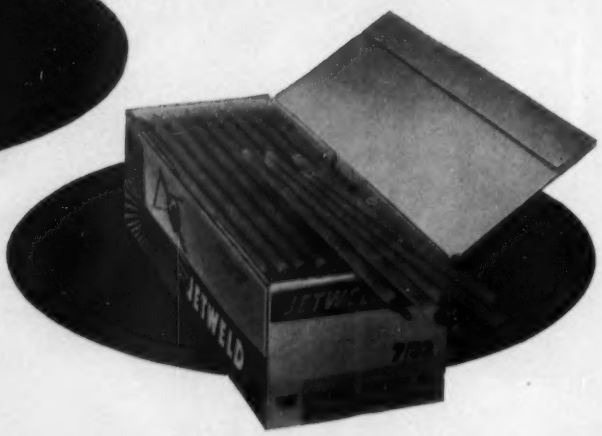
You can use Atlas Compo Forms for practically any shape or type of structure, and actual job records show that savings seldom are less than 5¢ per square foot per pour... often run to 15¢ and more.

Atlas Compo Forms are furnished on a liberal rental-with-option-to-buy basis. If you are figuring a job now, send plans for quotation. Otherwise, write for file information for future job reference.

IRVINGTON FORM & TANK CORPORATION

DEPARTMENT CM9, 20 VESEY STREET, NEW YORK 7, N.Y.

Welding industry's greatest cost-cutting twins . . .



IDEALARC and JETWELD

Never before has any combination of welder and electrode offered such a cost-saving potential in faster, easier welding. Here's why:

Idealarc for easy, efficient operation . . . first welder to give you *both*
AC AND DC WELDING CURRENT
with Dual Arc Control where you select "soft arc" or "forceful arc" on
AC as well as DC
and in addition . . . hot starting on
DC as well as AC

Jetweld for high-speed operation . . . first universally adopted iron-powder electrode for
extra-fast welding
high deposition
drag operation

LET LINCOLN DEMONSTRATE HOW YOU CAN PROFIT . . . NOW. Send for Bulletin 1343. Write . . .

THE LINCOLN ELECTRIC COMPANY
Dept. 2704 • Cleveland 17, Ohio
The World's Largest Manufacturer of Arc Welding Equipment

States to Get $875 Million in Federal Road Aid

The final installment of the record federal-aid highway program authorized by Congress in 1954 has been apportioned to the states five months ahead of schedule. The Bureau of Public Roads announced that $875 million in federal aid funds will be distributed to the states during the fiscal year beginning July 1, 1956 (see table below).

This stepped up federal aid program is expected to boost highway construction work well above the current level. During the first eight months of 1955, contractors signed up a record of $1.4 billion in total highway awards. This is 20% higher than the 1954 record.

States Will Get This Much Federal Aid Highway Money in Fiscal '57

State & Region	Primary roads	Secondary & feeders	Urban highways	Inter-state system	Total fed. aid
	Millions of dollars				
NEW ENGLAND	13.4	7.5	13.3	9.9	44.1
Maine	2.7	1.9	0.7	1.4	6.7
New Hampshire	1.6	1.0	0.5	1.1	4.2
Vermont	1.6	1.0	0.3	1.1	3.9
Massachusetts	4.0	1.5	7.2	3.7	16.3
Rhode Island	1.6	1.0	1.2	1.1	4.9
Connecticut	2.0	1.0	3.4	1.7	8.1
MID-ATLANTIC	37.3	18.5	48.7	19.2	123.8
New York	14.9	6.0	23.2	12.2	56.2
New Jersey	4.1	1.4	7.6	3.8	16.8
Pennsylvania	12.4	7.4	13.1	9.2	42.1
Maryland	2.8	1.7	2.9	2.1	9.5
D.C.	1.6	1.0	1.5	1.1	5.2
Delaware	1.6	1.0	0.4	1.1	4.0
SOUTH	64.6	51.0	23.0	35.3	173.9
Virginia	6.0	4.7	2.7	3.5	16.8
W. Virginia	3.5	3.0	1.1	2.1	9.7
No. Carolina	7.9	6.7	2.2	4.4	21.3
So. Carolina	4.3	3.6	1.2	2.3	11.4
Georgia	7.8	6.0	2.5	4.0	20.3
Florida	5.1	3.4	3.1	2.9	14.6
Alabama	6.7	5.2	2.3	3.5	17.7
Mississippi	5.6	4.7	1.0	2.8	14.1
Louisiana	4.9	3.6	2.5	2.9	13.9
Kentucky	5.9	4.9	1.8	3.2	15.8
Tennessee	6.9	5.3	2.5	3.7	18.4
MIDDLE WEST	48.0	29.7	37.8	29.9	145.3
Ohio	11.0	6.7	10.0	7.4	35.1
Indiana	7.5	5.2	4.1	4.2	21.0
Illinois	12.2	6.6	12.1	8.1	39.0
Wisconsin	7.5	5.2	3.4	3.9	20.0
Michigan	9.9	6.0	8.1	6.2	30.2
WEST OF MISS.	102.4	71.6	26.2	45.9	246.0
Minnesota	8.3	5.9	2.8	3.9	21.0
Iowa	7.6	5.6	2.1	3.5	18.8
Missouri	9.2	6.2	4.3	4.7	24.5
Arkansas	5.3	4.2	1.0	2.5	13.0
No. Dakota	4.6	3.4	0.3	1.9	10.2
So. Dakota	5.0	3.6	0.3	2.0	11.0
Nebraska	6.1	4.3	1.0	2.4	13.9
Kansas	7.7	5.4	1.6	3.2	17.6
Oklahoma	6.8	4.9	1.9	3.1	16.7
Texas	30.6	13.8	8.3	9.9	52.6
Montana	6.3	4.4	0.4	2.4	13.5
Wyoming	3.9	2.7	0.2	1.7	8.5
Colorado	5.7	3.8	1.4	2.3	13.2
New Mexico	5.1	3.5	0.6	2.1	11.3
FAR WEST	41.5	25.9	21.3	22.0	110.7
Idaho	3.9	2.7	0.3	1.7	8.7
Utah	3.6	2.4	0.7	1.7	8.4
Arizona	4.7	3.2	0.7	2.0	10.6
Nevada	4.1	2.7	0.1	1.8	8.7
Washington	5.2	3.5	2.6	2.8	14.1
Oregon	5.4	3.8	1.4	2.3	12.9
California	14.5	7.5	15.4	9.8	47.2
Hawaii	1.6	1.0	0.6	—	3.2
Puerto Rico	1.6	1.7	1.5	—	4.9

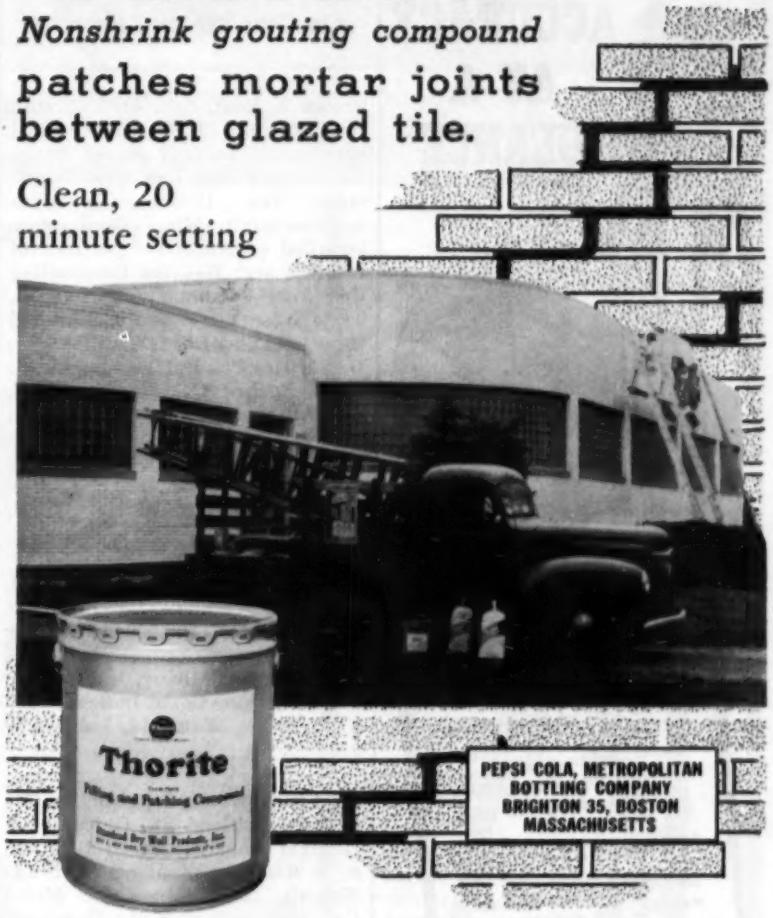
BIG JOBS OF THE MONTH . . . Next page

THORITE

Nonshrink grouting compound

patches mortar joints between glazed tile.

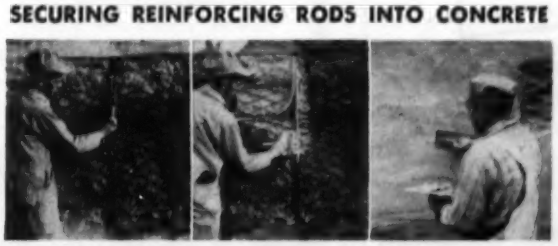
Clean, 20 minute setting



valuable for many uses!

Use THORITE for patching blistered concrete, where reinforcing rods are exposed and corroded, for patching cornices, sills, lintels, belt courses, grain elevators, bridges, underpasses, reservoirs, dams, water filtration plants.

SECURING REINFORCING RODS INTO CONCRETE



Surface and reinforcing rods are sandblasted and thoroughly cleaned. An application of Thorite, by brush, over rods and concrete, previous to filling patch with Thorite, by trowel, is made.

Get our pictorially described literature
"HOW TO DO IT"
STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

...DEPENDABLE ACCURACY AT A GLANCE

KERN'S DKM1
TEN SECOND THEODOLITE

(With Optical Micrometer)
Is built with traditional Swiss craftsmanship incorporating the latest technical advances giving the modern engineer

ACCURACY AT A GLANCE

DESIGNED FOR land surveying, big construction and engineering operations spot checking.

FAST DIRECT READING to 10"—safe estimation to 1". All readings from 1 position.

COMPACT INSTRUMENT is highly portable. Only 6 lbs. in weight and 7" high including metal carrying case.

MORE RELIABLE READING IN LESS TIME!
Ask for Detailed Brochure DK 516-3

SERVICE DEPARTMENT
FACTORY TRAINED PERSONNEL

Kern AARAU
The FINEST in SURVEYING EQUIPMENT

KERN INSTRUMENTS INC.
120 Grand St., White Plains, N. Y.

SOME BIG CONTRACT AWARDS OF THE MONTH

Brown & Root, Inc., 4100 Clinton Dr., Houston, Tex. Furnish field supervision for 377 mi of 30-in. natural gas pipe line from Beaumont, Tex. through Louisiana to Kosciusko, Miss. Contractors awarded contracts for portions of the line are: **Houston Contracting Co.**, 2707 Ferndale St., Houston, Tex.; **Tulsa Williams Co.**, National Bank of Tulsa Bldg., Tulsa, Okla.; **H. C. Price Co.**, Bartlesville, Okla.; **H. B. Zachry Co.**, Harding Blvd, San Antonio, Tex.; **Pentzien, Inc.**, 1504 Dodge St., Omaha, Neb.; **Missouri Valley Dredging Co.**, 222 William St., Omaha, Neb.; **J. Ray McDermott**, Harvey, La. Total, $70,883,000.

Green Construction Co., Oaktown, Ind. Site grading, railroad tracks included, for 300,000-kv power plant, coal generator, electric power plant near Albany, Ind. for the Public Service Co. of Indiana, 1000 E. Main St., Plainfield, Ind. $45,000,000.

Gust K. Newberg Construction Co., 2040 N. Ashland St., Chicago, Ill. General construction 1.5-million sq ft stamping plant near Chicago Heights, Ill. for the Ford Motor Co., 3000 Schaefer St., Dearborn, Mich. $25,000,000.

James Stewart Co., 600 W. Jackson Blvd., Chicago 6, Ill. Two 6,500,000-bu grain elevators in connection with conversion of Lake Calumet area to Port District at Chicago for Chicago Regional Port District, 160 N. LaSalle St., Chicago 1. $17,766,853.

Darin & Armstrong, Inc., 2041 Fenkell St., Detroit, Mich. 1,300,000 sq ft chassis parts plant, 17-Mile Road and Mound Road, Sterling, Mich. for Ford Motor Co., 3000 Schaefer St., Dearborn, Mich. $25,000,000.

A. Bentley & Sons Co., Inc., 201 Belmont S Ave., Toledo, Ohio. Expand facilities including new grinding and polishing line for glass factory, expansion power steam and water facilities, etc. for Libbey-Owens-Ford Glass Co., National Bank Bldg., Toledo, Ohio. $12,000,000.

CM Lodestar®

ENTIRELY NEW differently NEW

CAPACITIES: from ⅛ to 1 ton. Single and 3 phase. ¼ ton model weighs only 51 pounds.

$149.50 and up

Built to serve you for its normal life without costly maintenance.

. . . the first truly "heavy duty" version of the small electric hoist.

. . . complete flexibility—interchangeable suspension—quick voltage change.

FEATURING:

- Push Button Control
- Self-Adjusting Heavy Duty Brake
- Sealed-in Lifetime Lubrication
- Overload Protection
- Fully Enclosed Components
- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

WRITE US
or call your CM distributor for literature, prices and quick delivery from stock.

CM HOISTS AND CHAIN

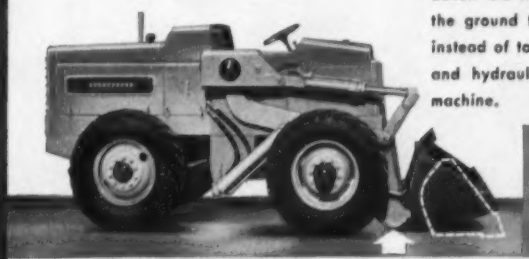
CHISHOLM-MOORE HOIST DIVISION
Columbus-McKinnon Chain Corporation
Tonawanda, New York
Regional Offices: New York • Chicago • Cleveland
In Canada:
McKinnon Columbus Chain Ltd., St. Catharines, Ont.

Three completely New PAYLOADER® tractor-shovels

with new "more-yardage" features

POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



model HU 1 cu. yd.

40° BREAK-OUT at ground level

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS—because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.

model HH 1½ cu. yd.

SAFETY and STABILITY

Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

model HO 2 cu. yd.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

These three all-wheel-drive "PAYLOADER" units are outstanding examples of Hough's continuing pioneering and leadership in tractor-shovel design. They have more digging power, get big bucket loads easier, can carry them faster and safer.

They are full of other features and improvements that boost output, operator comfort and safety and that lower the cost of digging, scooping-up, loading, moving and piling earth and bulk-materials.

Your "PAYLOADER" Distributor is ready to demonstrate these new units and what they can do — for you.

HOUGH-DESIGN HOUGH-QUALITY

More Horsepower per bucket capacity than any other standard models. Either diesel or gasoline engines available.

Easy to Operate Fullest operator visibility for safe, fast maneuvering; power steering; powerful hydraulic brakes; adjustable seat with molded foam-rubber cushions.

Powerful Transmissions Powershift transmission is standard equipment on the big model HO; four-speed full-reversing types on model HH and HU. Torque converter drives are standard equipment on all models — multiply engine torque up to 350% — act as shock absorbers for the entire power train.

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706 Sunnyside Ave. Libertyville, Illinois

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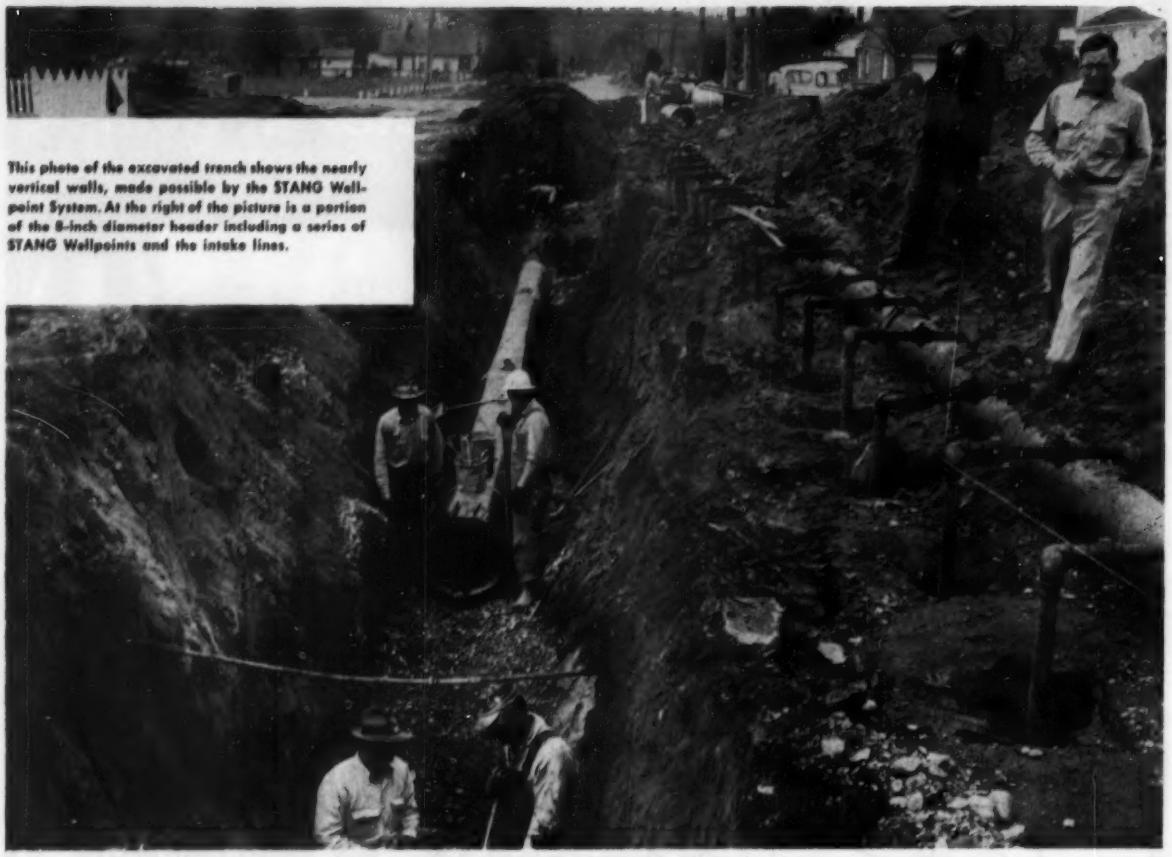

This photo of the excavated trench shows the nearly vertical walls, made possible by the STANG Wellpoint System. At the right of the picture is a portion of the 8-inch diameter header including a series of STANG Wellpoints and the intake lines.

Like water off a duck's back...

In the Pacific Northwest where rainfall is heavy and drainage slow, STANG Wellpoint Systems have proved the profitable and efficient answer to the unwatering of many construction projects.

At Puyallup, Washington, a particularly tough assignment was completed by STANG. Unwatering this sewer trench at Puyallup proved to be no easy job . . . quicksand and mud presented a real problem. STANG engineered and installed a Wellpoint System, enabling the contractor to lay 200 feet of 48-inch pipe per day in a completely dry, 6½-foot by 9-foot trench without danger of uplift, "boils" or sloughing.

Call on STANG equipment, experience and engineering services to solve *your* water handling problems—any size, any type, *anywhere*. STANG engineers are always available for consultation.

For free 100-page catalog, call or write the Stang district headquarters nearest you.

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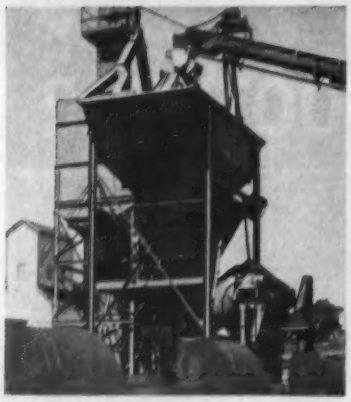

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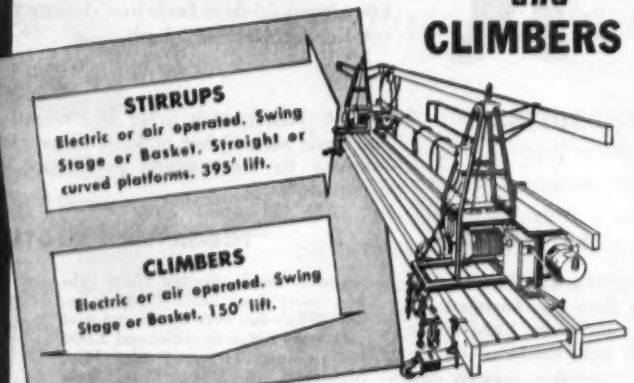

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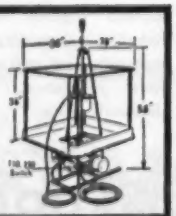

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Owned by George M. Brewster and Son, Inc.—this new Lorain 85, with a 2½-yd. dipper and a 26-ft. boom, is working on the New York Thruway, where contract called for 2½-million yards of grading on a 4.7 mile stretch near Nyack.

New Lorain 85 drives through fluid

for maximum economy and efficiency

The new Lorain 85, recently introduced by the Thew Shovel Co., Lorain, Ohio—features a Twin Disc Fluid Power Take-Off to provide maximum economy and efficiency. The fluid drive unit provides a "cushion" that eliminates shock loads—protecting *both* driving and driven equipment. It prolongs the life of cables and reduces fuel consumption and maintenance costs.

The Lorain 85, shown above, is the *seventy-seventh* Lorain to be purchased through the years by George M. Brewster and Son, Inc., Bogota, N. J. It is one of four new "85's" just added to this well known contractor's fleet. This might be interpreted as a vote of confidence in Thew-Lorain—and in their *standard* component parts.

The Twin Disc fluid PTO has been time and job proved on other Lorain models for many years. In fact, Thew-Lorain pioneered the application of fluid power take-offs on power shovels . . . and Twin Disc Fluid Power Take-Offs are *standard* in *all* Thew-Lorain crawler-mounted units in the heavy-duty ¾-yd. and the 1, 2, 2½-yd. classes. Let Twin Disc power linkage specialists help solve *your* particular problem! Twin Disc Clutch Company, Racine, Wisconsin, Hydraulic Division, Rockford, Illinois.

TWIN DISC

Fluid Couplings

Wagon drills, equipped with Bethlehem Hollow, chew blast holes on Sand Mountain, between Attalla and Boaz, Ala.

150,000 cu yd of Mountain Rock Moved for Alabama Highway

As part of its improvement program, the Alabama State Highway Department recently called for the relocation of 6.84 miles of the Attalla-Boaz highway, near Gadsden. Upon completion late in 1955, the new route, through virgin country on Sand Mountain, will offer motorists a commanding view of the picturesque countryside.

To clear the way for the new road it was necessary to move 150,000 cu yd of medium-hard limestone. The contractors and engineers, McDowell & McDowell, Nashville, Tenn., accomplished this economically by means of jackhammers and wagon drills, equipped with 1-in.-hexagon Bethlehem Hollow Drill Steel, fitted with carbide-insert bits. The drill steel was fabricated and supplied by Cowin Equipment Co., Inc., Birmingham.

Whatever the rock-removal problem, you can be sure of steady, low-cost drilling with Bethlehem Hollow. This is because Bethlehem Hollow is rolled from a tough, fatigue-resisting steel. Its wide quenching range makes it easy to heat-treat for the ideal balance of hardness and wear-resistance. It also makes long-wearing threads and tough shanks.

Bethlehem Hollow comes in rounds, hexagons and quarter-octagons, generally in lengths of 18 to 25 ft, though longer when specified. You'll like it.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM HOLLOW DRILL STEEL

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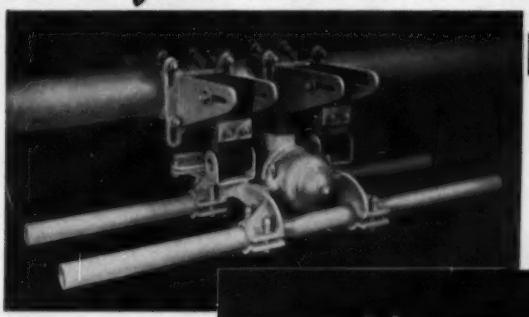
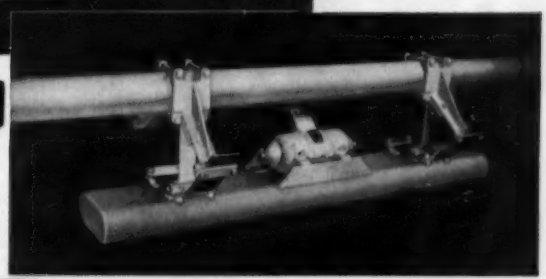
WHERE TO BUY

SURFACE and INTERNAL VIBRATION for CONCRETE PAVING



INTERNAL TYPE

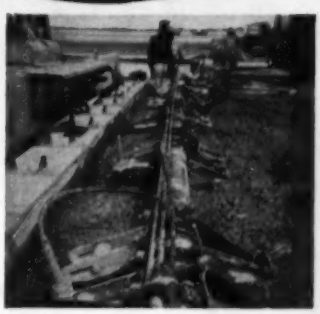
Tubes vibrate deep in concrete. One unit, as shown, for each 5'-0" (maximum) of slab width. Usually attached to front of finisher.



SURFACE TYPE

Tube vibrates on surface. Accomplishes thorough densification of 10" concrete slabs. One unit, as shown, for each 6'-0" (maximum) of slab width. Usually attached to rear of spreader.

JACKSON GIVES YOU BOTH!



A 25', 5-motor Tube of the internal type quickly plasticizing a tough mix on thick slab construction.

The contractor who owns a Jackson Paving Tube can quickly switch from INTERNAL to SURFACE vibration, or vice versa, and meet any concrete slab specifications — at a minimum of equipment investment.

Supplied with extraordinarily powerful motors, the JACKSON INTERNAL Paving Tube will thoroughly vibrate all concrete slabs as thick as 24" and as wide as 25', quickly plasticizing the very dry, harsh mixes. Attached to a standard finisher, its use materially reduces spreading labor where no spreader is used. Adapted to SURFACE vibratory operation, it will do a perfect job of vibrating any mix in depths up to 12". Powered by a Jackson Portable Power Plant mounted on parent equipment and controlled by its operator.

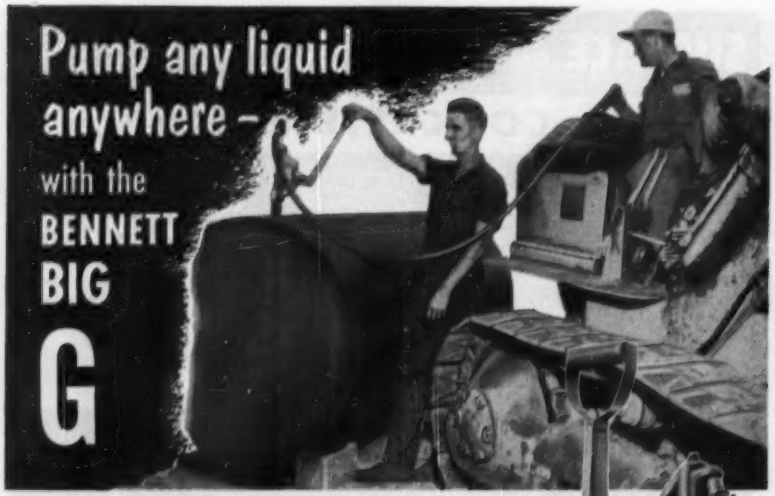
For better results and lowest possible costs buy a JACKSON Vibratory Paving Tube. See your Jackson distributor or write for complete details.

On this job, on which no spreader was used, the Paving Tube materially reduced the cost of spreading concrete.

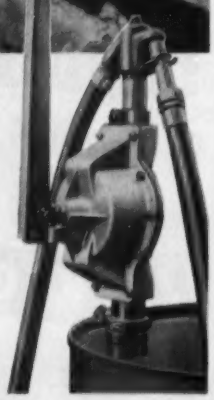
In this view note the highly plastic condition of the concrete accomplished by the surface type Paving Tube towed by the spreader.

JACKSON VIBRATORS, INC.
LUDINGTON MICHIGAN

Pump any liquid anywhere – with the BENNETT BIG G



Even on the most out-of-the-way projects, liquids handling is no problem with the Bennett BIG G transfer pump. Its bronze automotive-type pistons do away with expander springs, leathers, diaphragms and other trouble-causing construction details. Because every stroke is a suction stroke, the BIG G delivers more gallons for less work. It's available for drum mounting or with tripod mount and suction hose intake – transfers up to 20 gallons per minute (based on 100 strokes) over lifts up to 20 feet. Special models available for hard to handle liquids. Ask your John Wood Representative for details, or write:



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BENNETT PUMP DIVISION Muskegon, Michigan
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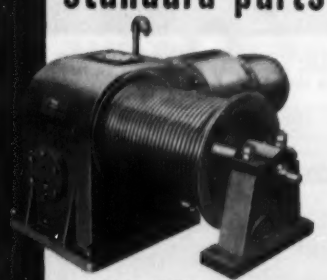

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Murphy Diesel offers three types of power to best suit your needs—mechanical power units, electric generating sets and Mech-Elec Units which will supply both mechanical and electrical power separately or simultaneously. Ask your Murphy Diesel Dealer to give you complete information on the unit that will serve you best.

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5339 W. Burnham St.
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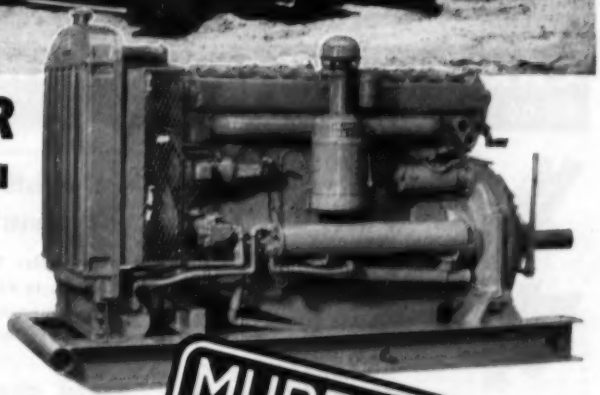
Sales, parts and service throughout the nation



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for construction

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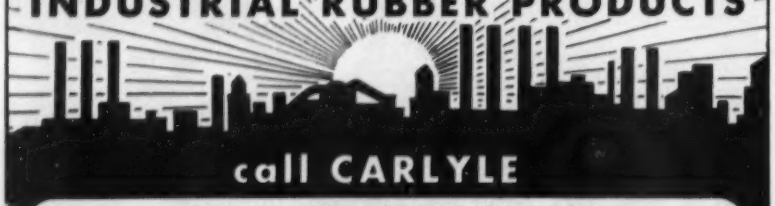

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PROMPT SHIPMENTS LOW COST QUALITY PRODUCTS

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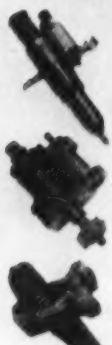

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With plants in New York City and New England, desires to add Road Building or Contractors' Equipment to line. Will consider affiliation with Company in this field.

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Get the exact lengths and sections you need of all standard sections delivered *on time* —and at Foster's low low rental rates

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Learn latest methods to organize and run work. Prepare for the top jobs.
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Experienced in design and manufacture of Batch Type Bituminous Plants. New department being created—excellent opportunity for advancement with leading heavy equipment manufacturer. Salary commensurate with qualifications. Also Engineers experienced in crushing, screening, conveying and bituminous equipment. All replies kept confidential. Send full details of personal and experience record with first letter.

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EMPLOYMENT

SELLING OPPORTUNITY OFFERED

Wanted. Salesmen to represent manufacturer of a newly patented, portable, accurate depth indicator useful to contractors, engineers, yachtsmen, Oil industry, etc. Aerco Industries, Dept. 2, Box 996, Springfield, Mass.

EQUIPMENT—used-surplus

FOR SALE

Newly Patented portable shallow water depth indicator, pressure activated, most accurate, ten day trial — refund three written guarantees. M-100: 0-25', $69.95. M-200: 0-50' $99.50. Custom models. Tel: Mr. Rich LO 73716. Aerco Industries, Box 996, Springfield, Mass.

Come & Get 'ers—Brand new and nearly new insulated Asphalt Tankers 5,500 gal. cap. priced for quick—and we mean Quick—sale. We can't use them and want to get rid of them, so somebody's going to get a bargain. Ideal for small operator who can't afford new equipment prices, but needs to expand his fleet—or a contractor that has seasonal use for this equipment. Also on hand MC-303 petro trailers, 4,700 to 7,400 gal. cap. Could be put to many uses. If you're in the market for used trailers—see us real quick—we're going to sell them and it might as well be you that gets the bargain. Also 7.5 x 20 used rims—selling these by the armload! Write, wire, phone—Johnny Griffin, Eldon Miller, Inc., Iowa City, Iowa.

For Sale: 120 Acres on State Road #209. Estimated to contain Million Yards Stone, Gravel, and Sand. Ideal site for Crusher and ample Water supply. D. B. Adams, Summitville, N. Y.

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Anything you want

that other readers of this publication can supply

OR—

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that other readers can use advertise it in the

Searchlight Section

Don't miss it!

a World's Fair of Power

THE GENERAL MOTORS POWERAMA

Lake Shore—South, Chicago · August 31 through September 25

Here's your chance to mix business with pleasure in a big way.

It's the General Motors Powerama created to celebrate the building of GM's 100,000,000th Diesel horsepower – staged at a fabulous wonderland on Chicago's Lake Front.

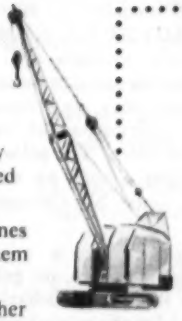
Here you'll see Allison TORQMATIC DRIVES smoothly transmitting Diesel engine power – see why these proved drives make any engine run better, more efficiently.

You'll see a wide range of TORQMATIC-equipped machines in action, watch them speed through their paces, see them change the face of the earth.

You'll watch TORQMATIC-equipped Army tanks and other military vehicles performing breath-taking maneuvers – see twin-jet Scorpions and a sensational VTO interceptor, both powered by Allison aircraft engines.

And here you'll see a brand-new idea in the world of entertainment—the first Technological Circus—"More Power to You"—an amazing combination of circus thrills—vehicular skills and big-time entertainment.

And best of all, *it's all free.* So bring the family – they'll enjoy it just as much as you.



POWERAMA FEATURES

- ★ *Stage show – music, dancers, fun for all*
- ★ *World's newest lightweight train*
- ★ *Diesel-powered boats, tractors, road-building machines*
- ★ *Oil-drilling rigs in action*
- ★ *Mammoth trucks*
- ★ *Scores of Diesel-powered units at work*

GM TORQMATIC

Allison

TORQMATIC DRIVES

Allison Division of General Motors, Indianapolis, Indiana

Methods Memo . . .

NINE FIRMS who manufacture more than 80% of all precast concrete roof deck report that they have sold more than 200,000,000 sq ft of this decking in the last 10 yr—enough to pave a 200-ft highway from New York to Washington, D.C., or from Detroit to Chicago. Their survey shows that precast concrete roofs have been installed at more than 8,000 locations for 6,063 different owners since the end of World War II. The automotive industry was the biggest single user with nearly 30,000,000 sq ft. Other big users were the chemical and food industries, schools, universities and public utilities.

NEW YORK CONTRACTORS have formed a new state-wide association whose purpose will be to defend the interests of general contractors. The new organization will be known as the General Contractors Association of New York State. The report of the committee that drew up plans for the GCA said a principal reason for its formation was that "practically all of the sub-trades have national and state associations to protect their interests, while in New York State the voice of the general contractor is merged with those of all the sub-trades, and he has no way to speak as a separate group on problems of specific interest to him."

CONSTRUCTION MEN GOING OVERSEAS don't have to leave the family at home just so the children can continue their schooling. The Calvert School, a non-profit, unendowed Baltimore institution, provides elementary school educations by mail for the children of overseas Americans.

If there are enough children to warrant a company school, Calvert will supply everything but the school building and the teacher. Morrison-Knudsen has a 12-pupil school at its Seyham Dam job in Turkey. Calvert supplies M-K with text books, work materials and a guidance manual for the teacher.

When there are too few children to establish a school, Calvert supplies individual courses for each child. The course assigns a certain amount of work for each school day and is organized so that parents can supervise the work. The home-study courses are pretested at Calvert's day school in Baltimore.

There are about 8000 Calvert students around the world. Among them are the daughter of a superintendent on a construction job at Chaman in Pakistan, the son of a foreman on a refinery project at Cutuco in El Salvador and many other children of construction men on remote jobs.

Gray Leads Off in New Feature

Bernard E. Gray, whose article on Bituminous Surface Treatments (page 82) is the first of a new CM&E series on paving, has seen about as much highway work as anyone we know. He has been interested in highway construction for more than 45 yr. During that time he has made first-hand studies of each of the 48 state highway systems, as well as those of several foreign countries. He has worked in the U.S. Bureau of Public Roads and in the Massachusetts and West Virginia highway departments. He retired as president of The Asphalt Institute last year after serving some 10-yr in that office.

A USEFUL PUBLICATION comes off the press this month. It's the latest compilation of rental rates for construction equipment prepared by Associated Equipment Distributors. This seventh edition contains national average rental rates for some 2,000 items of construction equipment based on a survey of AED's 700 U.S. distributor members. These averages are not actual rental rates in any particular section of the country; they are a composite rate for the information of construction equipment users. The price is $5, and you can get a copy by writing AED at 30 E. Cedar St., Chicago 11, Ill.

ARMY ENGINEERS are getting ready to start a study of the behavior of hurricanes and how to minimize the damage they do. Congress appropriated $1 million for the study. "The only solution for many areas may be modification of building codes or local action to restrict building," Brig. Gen. E. C. Itschner, Assistant Chief of Engineers for Civil Works, said. "But if there are solutions and corrective actions that can be taken, we intend to find them out."

AGC OF MINNESOTA has established a scholarship fund for civil engineering students at the University of Minnesota. The group's president, Ray V. Johnson of Winston Bros. Co., presented university officials with a check for $1,500 to cover the cost of one year's tuition, books and fees for five civil engineering students. The scholarship plan was worked out by a committee headed by A. H. Baumeister, past-president of the Minnesota AGC and including W. E. Carlson of Park Construction Co., N. E. Senescall of C. F. Haglin & Sons Co, and C. C. Adams of Fegles Construction Co., Inc.

F. H. MCGRAW & CO. of Hartford, Conn., was honored in an unusual way at the site of a construction job the company completed nearly 10 yr ago. The job: the Monmouth Park Race Track in New Jersey. The honor: the privilege of awarding a trophy to the winner of the sixth race which was named "The Construction." Mrs. Clifford S. Strike, wife of the president of the company, made the award.

TWO CEMENT PRODUCERS announce big expansion programs. Marquette Cement Mfg. Co. will spend $16 million to boost its annual capacity 3,000,000 barrels, and Lone Star Cement Corp. will enlarge its expansion program by $35 million to raise capacity 5,500,000 barrels.

In Venezuela's Mile-Long Boqueron Tunnel...

Boqueron Tunnel, Caracas, Venezuela.
Design and supervision by the Ministerio de Obras Publicas.
Gen. Contr.—Cia. Anonima Morrison-Knudsen de Venezuela.

Engineers Employ POZZOLITH...
To Improve Control of Concrete Quality...

POZZOLITH...the key to-

- lowest possible unit water content*
- close control of entrained air... placing consistency... rate of hardening
- reduced costs

* For a given set of materials and water-cement ratio, unit water content (water required per cubic yard of concrete) is the most important basic factor affecting the quality of concrete. A.C.I., Committee 613, 1944 Report, Page 655. Bureau of Reclamation's current Concrete Manual, Page 130.

Tunnels of all types—highway, railroad and water—are among the outstanding structures built since 1932 in which Pozzolith has enabled engineering to better control concrete quality.

Engineers employ Pozzolith with confidence because:

1. *proved performance*...60 million cubic yards of concrete produced with Pozzolith in past five years alone for all types of jobs.

2. *applied know-how*...over 70 skilled Master Builders' field technical men for product-use consultation.

3. *available everywhere*...1000 ready-mix and job-site plants now producing concrete with Pozzolith.

Ask us to demonstrate the advantages of Pozzolith for your project.

The MASTER BUILDERS Co

Subsidiary of American-Marietta Company

Lowers the boom on maintenance costs with TIMKEN® bearings to take shock loads

TO help keep its newest, largest dragline—Model 1855—doing a rugged job with minimum time-out for maintenance and repairs, the Harnischfeger Corp. relies on 15 Timken® tapered roller bearings at vital points. Some of these applications are the intermediate swing shaft, digging and hoist drum shaft, bevel pinion shaft and fairlead.

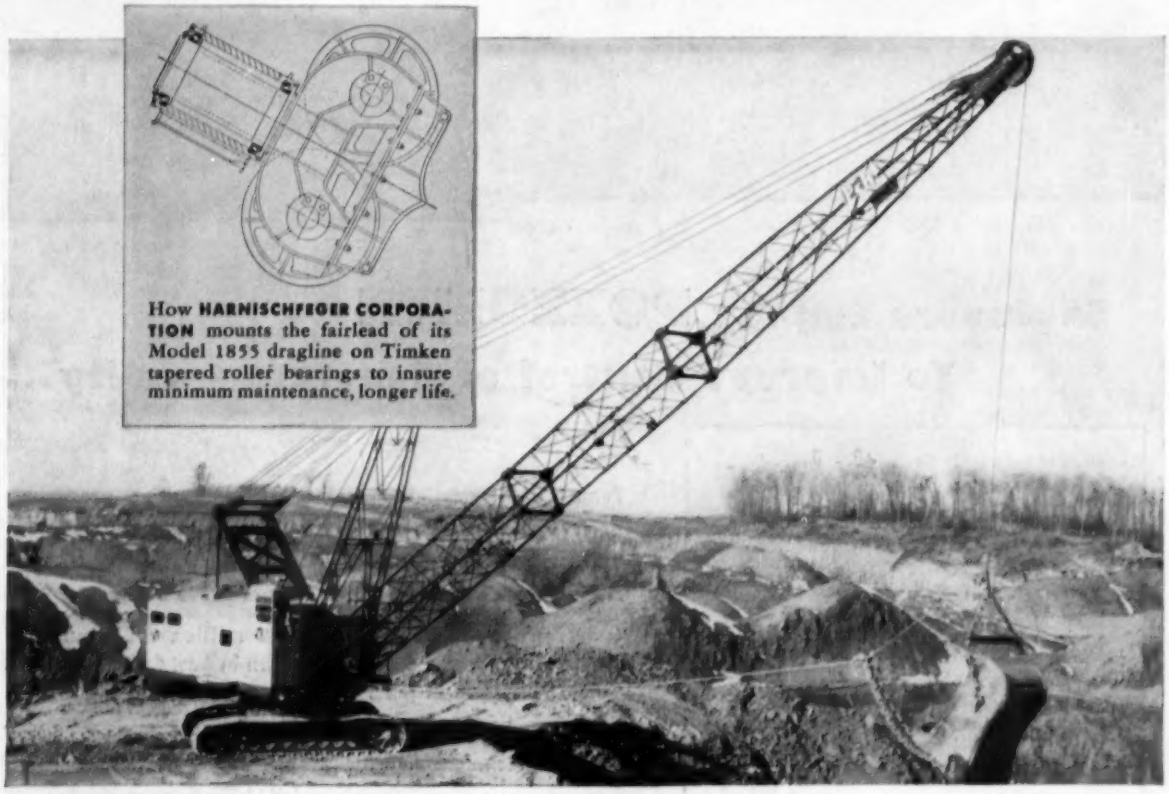
Imagine the shock loads put on the intermediate swing shaft when the cab, the boom and an 8 yard load of dirt being swung through the air are suddenly stopped and the direction reversed! Timken bearings take such shock loads with ease. That's because their rollers and races are case-carburized to give them tough, shock-resistant cores under hard wear-resistant surfaces.

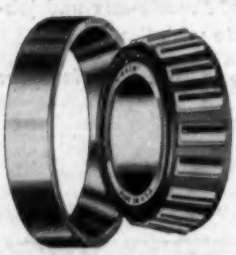
The Timken bearings on the digging and hoist drum shaft take the full weight of lifting and lowering the loaded bucket. Full line contact between rollers and races of Timken bearings gives them the extra load carrying capacity they need. And due to their tapered design, they carry both radial and thrust loads in any combination. Timken bearings take the thrust loads from the pinion gears and fairlead, insure accurate alignment. Gears mesh smoothly, last longer.

To get steel good enough for Timken bearings, we had to make our own. We're the only U. S. bearing maker that does. So always specify Timken bearings. They give longer life with less friction. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **HARNISCHFEGER CORPORATION** mounts the fairlead of its Model 1855 dragline on Timken tapered roller bearings to insure minimum maintenance, longer life.

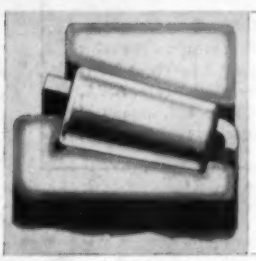




TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬮ AND THRUST →⬮← LOADS OR ANY COMBINATION →✳←